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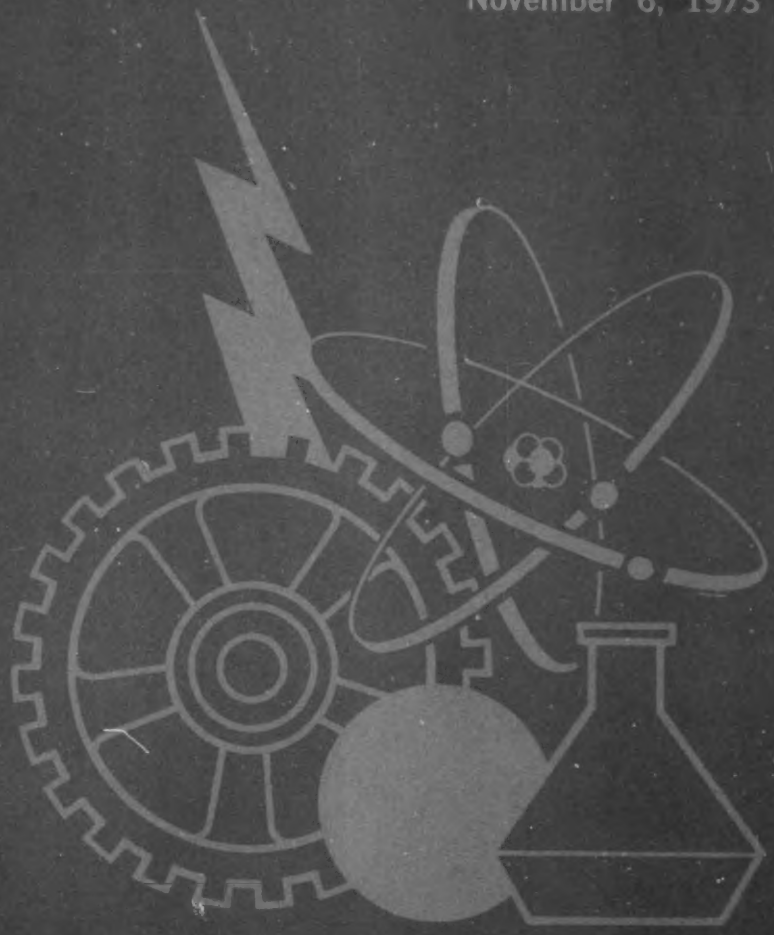
November 6, 1973



U. S. DEPARTMENT OF COMMERCE

Patent Office

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OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

November 6, 1973 Volume 916 Number 1

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PATENT OFFICE NOTICES

Board of Appeals Decisions Rendered in the Month of September 1973

Examiner affirmed	133
Examiner affirmed in part	9
Examiner reversed	32
Total	174

DEPARTMENT OF COMMERCE

Patent Office

APPLICATIONS RELATING TO ENERGY

In his Message of April 18, 1973, to The Congress "Concerning Energy Resources," the President stated that "with 6 percent of the world's population, we consume almost a third of all the energy used in the world." The President noted that our energy demands "now outstrip our available supplies, and at our present rate of growth, our energy needs a dozen years from now will be nearly double what they were in 1970." The President's Message of April 18 called for the development of a more comprehensive, integrated national energy policy and announced specific steps to carry out the policy. On June 29, 1973, the President announced a series of additional actions to deal with the Nation's energy problem. Among those actions were major efforts in energy research and development and in energy conservation.

In order to enhance and further the goals and actions announced by the President, the Patent Office will, on request, accord "special" status to all patent applications for inventions which materially contribute to (1) the discovery or development of energy resources, and (2) the more efficient utilization and conservation of energy resources. Examples of inventions in category (1) would be those relating to further developments in fossil fuels (natural gas, coal, and petroleum), nuclear energy, solar energy, etc. Category (2) would include inventions relating to the reduction of energy consumption in combustion systems, industrial equipment, household appliances, etc. In order that the Patent Office may implement this procedure, we request that all applicants desiring to participate in this program request that their applications be accorded "special" status. Such requests should be written, should identify the application by serial number and filing date, and should be accompanied by affidavits or declarations under rule 102 by the applicant or his attorney or agent explaining how the invention materially contributes to category (1) or (2) set forth above.

Requests should be addressed to the Commissioner of Patents, Washington, D.C. 20231.

RENE D. TEGTMEYER,
Acting Commissioner of Patents.

Date: Oct. 26, 1973.

Approved:

BETSY ANCKER-JOHNSON, Ph.D.,
Assistant Secretary for Science and Technology.

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

3,000,380, G. O. Doherty, MEANS AND METHODS OF INJECTING OR INFUSING FLUIDS INTO PATIENTS; **3,010,453,** same, APPARATUS FOR INTRAVENOUSLY ADMINISTERING FLUID; **3,017,884,** Doherty and Ballard, APPARATUS FOR INJECTING OR INFUSING FLUIDS INTO PATIENTS AND METHOD OF MAKING SAME, **filed** June 21, 1972, D.C. Mont. (Butte), Doc. C-2173, *George O. Doherty* v. *Deseret Pharmaceutical Company, Inc.*

3,002,219, J. A. Bried, METHOD OF AND APPARATUS FOR PICKING FOWL, **filed** Nov. 24, 1967, D.C., E.D. Calif. (Fresno), Doc. F-331-C, *Margery Bried Masterson* v. *Foster Poultry Farms.* Consent judgment, patent is valid, defendants have infringed, Apr. 27, 1973.

3,010,453. (See 3,000,380.)

3,017,884. (See 3,000,380.)

3,163,609. Sowman and Johnson, CRYSTALLINE SPHERULES; **Re. 26,294,** same, **filed** Dec. 11, 1967, D.C., S.D. Calif. (San Diego), Doc. 67-258-K, *Gulf General Atomic Incorporated* v. *Minnesota Mining & Manufacturing Company.* Stipulated order of dismissal: Gulf General Atomic Incorporated has been duly merged into its parent corporation, Gulf Oil Corporation, a Pennsylvania corporation, Apr. 18, 1973.

3,243,756, Ruete and Brown, SHIELDED ELECTRICAL CONNECTION; **3,344,391,** R. C. Ruete, WATERPROOF ELECTRICAL CONNECTIONS; **3,539,972,** Ruete, Aldighieri and Silva, ELECTRICAL CONNECTOR FOR HIGH VOLTAGE ELECTRICAL SYSTEMS; **3,654,590,** R. R. Brown, ELECTRICAL CONTACT DEVICES FOR HIGH VOLTAGE ELECTRICAL SYSTEMS, **filed** Mar. 19, 1973, D.C. Conn. (Bridgeport), Doc. B-731, *Amerace Esna Corporation* v. *Burndy Corporation.*

3,316,574(a), R. L. Pare, ROAD EXPANSION JOINT, **filed** Nov. 9, 1972, D.C. N.D. Ohio (Cleveland), Doc. C-72-1212, *Robert L. Pare and The General Tire & Rubber Co.* v. *The Johnson Rubber Company.*

3,316,574(b), R. L. Pare, ROAD EXPANSION JOINT; **Re. 26,733,** J. A. Welch, ELASTOMERIC EXPANSION JOINT, **filed** Nov. 9, 1972, D.C. Del. (Wilmington), Doc. 4514, *Robert L. Pare and The General Tire & Rubber Company* v. *Watson-Bowman Associates, Inc.*

3,344,391. (See 3,243,756.)

3,496,911, A. Chmelar, ELECTROSTATIC FLOCKING, **filed** Feb. 16, 1972, D.C., N.D. Ga. (Atlanta), Doc. C.A. 16204, *Velvetex Industrial Corporation* v. *Evershine Products, Inc.*

3,539,972. (See 3,243,756.)

3,572,245, B. W. Grayson, APPARATUS AND METHOD OF CONDUCTING STRING SHOT OPERATIONS; **3,648,612,** same, METHOD OF CONDUCTING STRING SHOT OPERATIONS IN AN OIL WELL, **filed** Mar. 13, 1973, D.C., E.D. Calif. (Fresno), Doc. F-776-C, *Bobby W. Grayson* v. *Don McGowan, Melvin McGowan et al.*

3,574,911, W. G. Penoyar, CUTTER AND INSERTS THEREFOR, **filed** Nov. 1, 1972, D.C., W.D. Mich. (Grand Rapids), Doc. G341-72 CA-7, *Milling Specialties, Inc.* v. *Kysor Industrial Corporation.* Stipulation of parties dismissed, Apr. 16, 1973.

3,623,289, J. L. Lowery, FLEXIBLE SPACING DEVICE FOR CONCRETE REINFORCING MATERIALS; **3,632,200,** E. F. Kingman, SYSTEM FOR MEASURING LIGHT TRANSMITTANCE THROUGH ABSORPTIVE OR DIFFUSIVE MEDIA, **filed** Ap. 3, 1973, D.C.N.J. (Newark), Doc. C-452-73, *Celesco Industries, Inc.* v. *Robert H. Wager Co., Inc. et al.*

3,623,289. (See 3,632,200.)

3,648,612. (See 3,572,245.)

3,654,590. (See 3,243,756.)

3,669,499, Semplonius and Kolk, CHAIR, **filed** June 16, 1972, D.C., N.D. Ga. (Atlanta), Doc. 16751, *Steelcase Inc.* v. *Blair Manufacturing Company, Inc. and Metalstand Company, Inc.* Consent judgment, ordered, adjudged and decreed: plaintiff owner of Patents 3,699,499, and Des. 225,843 and both valid. Defendants have infringed that an injunction perpetually enjoining defendants. Defendants' counterclaim dismissed with prejudice Mar. 19, 1973. **Same, filed** June 27, 1972, D.C., N.D. Ga. (Atlanta), Doc. 16785, *Steelcase Inc.* v. *Blair Manufacturing Company, Inc. and Metalstand Company, Inc.* Consent judgment, ordered, adjudged and decreed: Plaintiff owner of Patents 3,669,499 and Des. 225,843 and both valid. Defendants have infringed that injunction issue perpetually enjoining defendants. Defendants' counterclaim dismissed with prejudice Mar. 19, 1973.

3,696,323, Kinkaid and Asick, DIP HEADER, **filed** Apr. 16, 1973, D.C., S.D.N.Y., Doc. 73-1682, *AMP Incorporated* v. *Industrial Electronic Hardware Corp.*

3,702,160, T. P. Wharton, MOLDED PALLET, **filed** Apr. 24, 1973, D.C., W.D. Mich. (Grand Rapids), Doc. G106-73 CA-1, *Menasha* v. *Jarecki Corporation and Plastics of Grand Rapids.*

3,705,061, E. B. King, CONTINUOUS REDOX PROCESS FOR DISSOLVING COPPER, **filed** Apr. 25, 1973, D.C.N.J. (Newark), Doc. C-561-73, *Philip A. Hunt Chemical Corporation* v. *Southern California Chemical Co., Inc.*

Re. 26,294. (See 3,163,609.)

Re. 26,733. (See 3,316,574(b).)

Certificates of Correction for the Week of Nov. 6, 1973

P.P. 3,301.	3,699,618	3,721,431	3,731,773
D. 226,075	3,699,992	3,721,825	3,732,069
D. 226,797	3,701,319	3,721,966	3,732,230
3,015,177	3,701,927	3,722,211	3,732,482
3,424,649	3,702,054	3,722,348	3,733,091
3,546,392	3,705,799	3,722,477	3,734,551
3,561,019	3,706,862	3,722,541	3,734,724
3,581,524	3,707,368	3,722,711	3,734,785
3,583,991	3,707,771	3,722,817	3,735,025
3,591,988	3,708,857	3,723,094	3,735,128
3,596,069	3,710,422	3,723,152	3,735,605
3,603,866	3,710,463	3,723,260	3,735,608
3,608,636	3,710,788	3,723,262	3,736,331
3,609,661	3,710,869	3,723,416	3,736,378
3,612,811	3,711,515	3,723,525	3,736,631
3,614,338	3,711,762	3,723,572	3,736,724
3,618,973	3,711,798	3,723,698	3,737,122
3,620,923	3,713,239	3,723,717	3,737,159
3,627,103	3,713,524	3,724,355	3,737,210
3,627,593	3,713,559	3,725,472	3,737,316
3,627,791	3,715,292	3,725,605	3,737,400
3,629,072	3,715,442	3,725,948	3,737,909
3,631,506	3,715,689	3,725,988	3,738,336
3,634,183	3,715,692	3,726,652	3,739,550
3,645,418	3,716,158	3,726,803	3,740,108
3,650,795	3,716,706	3,726,961	3,740,815
3,653,601	3,717,003	3,727,002	3,744,559
3,658,564	3,717,824	3,727,177	3,744,628
3,665,041	3,717,870	3,728,094	3,744,663
3,668,206	3,718,040	3,728,356	3,744,690
3,672,891	3,718,130	3,728,426	3,744,725
3,684,420	3,718,405	3,728,521	3,746,270
3,685,316	3,718,406	3,728,535	3,746,633
3,688,982	3,718,466	3,728,994	3,746,953
3 690,854	3,719,180	3,729,283	3,747,273
3,691,377	3,719,219	3,729,373	3,747,744
3,692,768	3,719,715	3,729,389	3,748,248
3,693,827	3,719,807	3,729,826	3,748,514
3,693,891	3,720,060	3,730,332	3,749,198
3,694,446	3,720,133	3,730,554	3,749,560
3,695,524	3,720,209	3,730,673	3,749,567
3,696,095	3,720,230	3,730,827	3,749,809
3,697,521	3,721,227	3,731,017	3,749,865
3,698,198	3,721,286	3,731,278	3,749,884
3,698,204	3,721,340	3,731,398	3,749,999

Disclaimers

3,260,691.—*Edward Lavin*, Longmeadow and *Albert H. Markhart*, Wilbraham, Mass. COATING COMPOSITIONS PREPARED FROM CONDENSATION PRODUCTS OF AROMATICS, PRIMARY DIAMINES AND AROMATIC TRICARBOXYLIC COMPOUNDS. Patent dated July 12, 1966. Disclaimer filed June 13, 1973, by the assignee, *Monsanto Company*.

Hereby enters this disclaimer to claims 1 and 2 of said patent.

3,350,556.—*Kurt Franck* and *Robert G. McPhail*, Newark, Ohio. STREET LIGHTING LUMINAIRES. Patent dated Oct. 31, 1967. Disclaimer filed Sept. 28, 1973, by the assignee, *Holophane Company, Inc.*

Hereby enters this disclaimer to claims 1–11 of said patent.

3,449,622.—*Carl F. Wheatley, Jr.*, Somerset, N.J. TELEVISION DEFLECTION CIRCUITS. Patent dated June 10, 1969. Disclaimer filed Mar. 27, 1972, by the assignee, *RCA Corporation*.

Hereby enters this disclaimer to all claims of said patent.

3,503,059.—*Louis E. Ambrico*, Hyde Park, N.Y. PULSE CROWDING COMPENSATION FOR MAGNETIC RECORDING. Patent dated Mar. 24, 1970. Disclaimer filed Dec. 29, 1972, by the assignee, *International Business Machines Corporation*.

Hereby enters this disclaimer to claims 15, 16, 17 and 18 of said patent.

3,559,560.—*William R. Trahan*, Houston, Tex. CEILING BOXES FOR DISTRIBUTING AIR. Patent dated Feb. 2, 1971. Disclaimer filed June 25, 1973, by the assignee, *Texfan, Inc.*

Hereby enters this disclaimer to all claims of said patent.

3,583,116.—*David H. La Gue*, Kansas City, Mo. PARTITION SUPPORT SYSTEM. Patent dated June 8, 1971. Disclaimer filed Oct. 6, 1972, by the assignee, *The Glen O'Brien Movable Partition Co., Inc.*

Hereby enters this disclaimer to all claims of said patent.

3,594,606.—*Erling L. Lien*, Los Altos, Calif. VELOCITY MODULATION TUBE EMPLOYING CASCADED HARMONIC PREBUNCHING. Patent dated July 20, 1971. Disclaimer filed June 1, 1973, by the assignee, *Varian Associates*.

Hereby enters this disclaimer to claim 7 of said patent.

3,598,982.—*Philip L. Lawrence*, Riverside, Conn. SYSTEMS FOR MODIFYING FUNCTIONS INCLUDING A CONVOLUTION OPERATION. Patent dated Aug. 10, 1971. Disclaimer filed June 16, 1971, by the assignee, *Mobil Oil Corporation*.

Hereby disclaims the portion of the term of the patent subsequent to May 4, 1988.

3,639,787.—*Harry Charles Lee*, West Lafayette, Ind. INTEGRATED BUFFER CIRCUITS FOR COUPLING LOW OUTPUT IMPEDANCE DRIVE TO HIGH-INPUT IMPEDANCE LOAD. Patent dated Feb. 1, 1972. Disclaimer filed June 8, 1972, by the assignee, *RCA Corporation*.

Hereby enters this disclaimer to claims 1 through 4 of said patent.

3,647,570.—*Thomas James Lytle*, West Orange, N.J. OXYGEN TRAP SCARFING METHOD AND APPARATUS. Patent dated Mar. 7, 1972. Disclaimer filed June 6, 1973, by the assignee, *Union Carbide Corporation*.

Hereby enters this disclaimer to claims 3 and 4 of said patent.

3,652,672.—*Jonathan M. Kleigman* and *Robert K. Barnes*, Charleston, W. Va. NOVEL DIIMINE COMPOUNDS. Patent dated Mar. 28, 1972. Disclaimer filed June 18, 1973, by the assignee, *Union Carbide Corporation*.

Hereby enters this disclaimer to claims 1–3 of said patent.

3,689,191.—*Aubrey Joseph Westbrook*, Kilwinning, and *Ian David MacKnight Thomson*, Irvine, Scotland. MOULDING APPARATUS. Patent dated Sept. 5, 1972. Disclaimer filed Feb. 28, 1972, by the assignee, *Plastic Rotational Moulding Limited*.

Hereby disclaims the portion of the term of the patent subsequent to Jan. 19, 1988.

3,695,274.—*Thomas W. Summers*, Jeffersontown, Ky. PISTON TYPE CIGARETTE FILTER. Patent dated Oct. 3, 1972. Disclaimer filed Apr. 27, 1973, by the assignee, *Brown & Williamson Tobacco Corporation*.

Hereby enters this disclaimer to claim 2 of said patent.

3,704,207.—*Stokes Fenimore Burtis*, Swarthmore, Pa. PROCESS FOR FORMING AN ISOLATED CIRCUIT PATTERN ON A CONDUCTIVE SUBSTRATE. Patent dated Nov. 28, 1972. Disclaimer filed Jan. 11, 1973, by the assignee, *RCA Corporation*.

Hereby disclaims the portion of the term of the patent subsequent to Aug. 8, 1989.

3,704,208.—*Robert Ritter Russo*, Indianapolis, Ind. PROCESS FOR FORMING A CONDUCTIVE COATING ON A SUBSTRATE. Patent dated Nov. 28, 1972. Disclaimer filed Jan. 11, 1973, by the assignee, *RCA Corporation*.

Hereby disclaims the portion of the term of the patent subsequent to Aug. 8, 1989.

3,715,869.—*Herbert K. Holden*, Bon Air, Va. FILTER. Patent dated Feb. 13, 1973. Disclaimer filed July 6, 1972, by the assignee, *American Filtrona Corporation*.

Hereby disclaims the portion of the term of the patent subsequent to Oct. 12, 1988.

3,723,763.—*Daniel John Udovic*, Holmdel, N.J. QUASI-RMS MEASUREMENT CIRCUIT UTILIZING FIELD EFFECT TRANSISTOR AS A SWITCH. Patent dated Mar. 27, 1973. Disclaimer filed July 16, 1973, by the assignee, *Bell Telephone Laboratories, Incorporated*.

Hereby enters this disclaimer to all claims of said patent.

3,728,180.—*Harold J. Messerschmidt*, Stockholm, *Karl Heyman*, Montclair, and *Bernadou W. Johnsen II*, Paterson, N.J. POWDERLESS ETCHING BATH COMPOSITIONS. Patent dated Apr. 17, 1973. Disclaimer filed July 10, 1973, by the assignee, *Mona Industries, Inc.*

Hereby disclaims the portion of the term of the patent subsequent to Apr. 3, 1990.

3,730,899.—*Harold J. Messerschmidt, Jr.*, Stockholm, *Karl Heyman*, Montclair, and *Bernadou W. Johnsen II*, Paterson, N.J. POWDERLESS ETCHING BATH ADDITIVE. Patent dated May 1, 1973. Disclaimer filed July 10, 1973, by the assignee, *Mona Industries, Inc.*

Hereby disclaim the portion of the term of the patent subsequent to Apr. 3, 1990.

3,758,999.—*Joseph J. Matvey*, Pittsburgh, Pa. GRAVE MARKER PROTECTIVE STRUCTURE. Patent dated Sept. 18, 1973. Disclaimer filed June 12, 1973, by the inventor.

Hereby disclaims the portion of the term of the patent subsequent to Sept. 14, 1988.

3,762,598.—*Herbert Gayner*, Monroeville, and *David A. Smith*, Penn Hills, Pa. THERMALLY TREATED CONTAINER WALL. Patent dated Oct. 2, 1973. Disclaimer filed June 11, 1973, by the assignee, *Aluminum Company of America*.

Hereby disclaims the portion of the term of the patent subsequent to May 29, 1990.

Dedications

2,773,951.—*Alexander Finlay, Jr.*, Columbus, *William Hecox*, Groveport, and *Robert L. Thompson*, Columbus, Ohio. MULTIPLE-CONTACT SWITCH. Patent dated Dec. 11, 1956. Dedication filed May 7, 1973, by the assignee, *The Battelle Development Corporation*.

Hereby dedicates to the People of the United States the entire remaining term of said patent.

2,778,802.—*Robert K. Willardson, Harvey L. Goering* and *Theodore C. Harman*, Columbus, Ohio. INTERMETALLIC COMPOUNDS OF GROUPS III AND V METALS CONTAINING SMALL AMOUNTS OF NICKEL, COBALT OR IRON. Patent dated Jan. 22, 1957. Dedication filed May 7, 1973, by the assignee, *The Battelle Development Corporation*.

Hereby dedicates to the People of the United States the entire remaining term of said patent.

3,633,368.—*Iver T. Rosenlund*, Kennett Square, Pa. EXHAUST GAS REACTOR. Patent dated Jan. 11, 1972. Dedication filed June 28, 1973, by the assignee, *E. I. du Pont de Nemours and Company*.

Hereby dedicates to the Public the entire term of said patent.

3,640,755.—*Walter J. Barth*, Hockessin, Del. COATINGS FOR AUTOMOTIVE EXHAUST GAS REACTORS. Patent dated Feb. 8, 1972. Dedication filed June 28, 1973, by the assignee, *E. I. du Pont de Nemours and Company*.

Hereby dedicates to the Public the entire term of said patent.

Disclaimers and Dedications

Des. No. 178,121.—*Kurt Franck* and *Robert G. McPhail*, Newark, Ohio. STREET LIGHTING REFRACTOR. Patent dated June 26, 1956. Disclaimer and dedication filed Sept. 18, 1973, by the assignee, *Holophane Company, Inc.*

Hereby disclaims and dedicates to the Public the entire term of said patent.

2,891,870.—*Meyer S. Selby*, Revere, and *Edward R. Baush*, Bedford, Mass. METHOD OF PACKAGING. Patent dated June 23, 1959. Disclaimer and dedication filed Jan. 20, 1972, by the assignee, *W. R. Grace & Co.*

Hereby disclaims the remaining term of said patent and dedicates said patent to the Public.

PATENT EXAMINING CORPS

WILLIAM FELDMAN, Acting Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF OCTOBER 13, 1973

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	10-17-72
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	8-09-72
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Acting Director Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	7-17-72
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	7-07-72
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. FRIEDMAN, Director Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	5-15-72
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	3-07-73
SPECIAL LAWS ADMINISTRATION, GROUP 220—R. L. CAMPBELL, Director Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	12-07-72
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	12-01-72
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—L. FORMAN, Director Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food: Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	5-15-72
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director Semi-Conductor and Space Discharge Systems and Devices, Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	11-30-72
DESIGNS, GROUP 290—R. L. CAMPBELL, Director Industrial Arts; Household, Personal and Fine Arts.	1-12-72
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. BUCHLER, Acting Director Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	12-04-72
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus: Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	10-02-72
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	12-07-72
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	10-13-72
MISCELLANEOUS CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—T. J. HICKEY, Director Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	9-20-72

Expiration of patents: The patents within the range of numbers indicated below expire during October 1973, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,764,758 to 2,769,171, inclusive
Plant Patents..... Numbers 1,822 to 1,825, inclusive

PLANT PATENTS

GRANTED NOVEMBER 6, 1973

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,404
CHRYSANTHEMUM PLANT

Helmut Karl Gortz, Cagliari, Sardinia, Italy, assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Aug. 11, 1971, Ser. No. 170,936
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—74 1 Claim

1. A new and distinct cultivar of daisy form chrysanthemum characterized particularly to the uniqueness when compared to the parent cultivar Yellow Bonnie Jean by its darker yellow flower, color, its 2" more vigor, and far less oxidation or fading of the yellow pigmentation of the petals under high light, high temperature conditions.

3,405
CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., Doylestown, and William E. Duffett, Akron, Ohio, assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Sept. 30, 1971, Ser. No. 185,459
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—78 1 Claim

1. A new and distinct cultivar of chrysanthemum characterized particularly as to its uniqueness when compared to the parent cultivar Paragon by its yellow flower color, by its two day earlier response, and by its petal count which is approximately 15% to 25% greater, which contributes to a more highly crowned flower which is more pronounced in the high light periods of the year.

3,406
CARNATION PLANT

William Pomeroy Thomson, 74 Westland Ave., West Hartford, Conn. 06107

Filed Jan. 24, 1972, Ser. No. 220,501
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—71 1 Claim

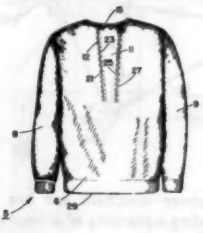
A new variety of carnation plant discovered in the course of meristem culture of the unpatented variety Barlo, which is of French origin, the new variety being a sport of Barlo and being especially distinguished by its remarkable resistance to splitting.

PATENTS

GRANTED NOVEMBER 6, 1973

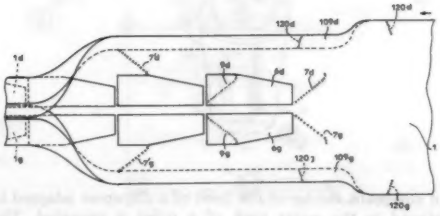
GENERAL AND MECHANICAL

3,769,634
GARMENT CONSTRUCTION
Nicholas Florens, Jr., Chicago, Ill., assignor to Julia Oakden and Tina M. Oakden, Carlton, Oreg., part interest to each
Filed Feb. 14, 1972, Ser. No. 226,050
Int. Cl. A41d *1/04*
U.S. Cl. 2—90 **5 Claims**



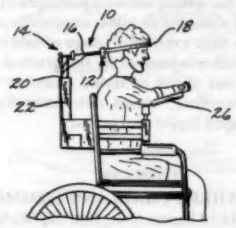
A body-encircling portion of a garment, such as a sweater, dress, glove and others, has an elongated opening therein terminating at a margin edge thereof, and has an integrally connected closure member which closes the opening when a pair of fastening devices detachably connect the side marginal edges thereof to the garment, whereby the closure member may be partially or entirely disconnected along its side marginal edges and folded over onto itself to uncover the opening to any desired extent for facilitating the use of the garment and for appearance purposes.

3,769,635
METHOD OF LAYING ACCESSORY PARTS ONTO THE NECK PORTION OF GARMENTS
Claude Raymond Pierron, Epinal, France, assignor to Les Applications Industrielles Vosgiennes SAPIVOG, Bois-L'Abbe-Uxegney, France
Filed Sept. 2, 1971, Ser. No. 177,300
Int. Cl. A41d
U.S. Cl. 2—243 R **8 Claims**



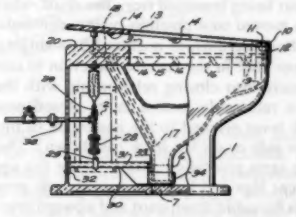
A jacket or like garment made up from a continuous strip of yielding sheet material by folding, cutting and gluing is provided adjacent to its neck portion with an accessory part such as a collar or hood, made from an auxiliary strip and glued onto the right or wrong side of the neck line of the garment.

3,769,636
END POINT CONTROL OF UPPER EXTREMITY ORTHOTIC BRACE USING HEAD ORIENTATION
Jon H. Friedman, Mundelein, Ill., assignor to Iowa State University, Research Foundation, Ames, Iowa
Filed May 2, 1972, Ser. No. 249,654
Int. Cl. A61f *1/00*
U.S. Cl. 3—1.1 **10 Claims**



An end-point control of an upper-extremity orthotic brace employing head orientation is disclosed herein which is particularly well suited for quadriplegics who are able to spend some portion of their day in a wheel chair. A first gimbal is detachably secured to the patient's head by means of a head strap or the like and is interconnected by a shaft to a second gimbal which is secured to the wheel chair. The first and second gimbals have responsive means thereon such as single turn potentiometers which are responsive to azimuth, elevational and range movements of the patient's head. A control system is connected to the potentiometers for driving a powered device such as an arm brace so that the patient can control the operation of the arm brace through coordinated head movements.

3,769,637
AUTOMATIC WATER CLOSET
Emil C. Llames, 694 E. de los Santos Ave., Quezon City, Philippines
Filed May 6, 1971, Ser. No. 140,692
Claims priority, application Philippines, May 15, 1970, UM 1341; Mar. 12, 1971, 12283
Int. Cl. E03d *1/34, 5/04*
U.S. Cl. 4—64 **8 Claims**



This invention pertains to automatic water closets which depart from the conventional closets in that the latter type utilizes pocket of water to shut off the foul air emanating from the waste's tank and at the same time floats the newly evacuated wastes on the said pocket of water.

This new closet does away with presently existing reservoirs and other auxiliaries but instead makes use, as one of its main features, of a slow-acting water valve which controls the flow of water direct from the sewage pipe, said valve being actuated by the user's own weight.

When in use, the closet's valve is opened by the depressing action on the closet's seat as effected by the user's weight. This sets a system of spring, rods and links to open simultaneously the said valve and a cover means the opening of which spills the sealant and exposes the discharge port through which the newly evacuated waste is disposed immediately (i.e., not made to float). Since the valve is open, cleansing water is flushed continuously through a system of orifices and outlets.

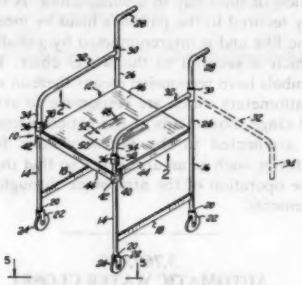
The valve in itself is a unit which is a confined system of rods, washers and spring. As the weight of the user is lifted, the releasing action of the spring closes a passageway of the water at a predetermined slowness to allow continuity of flow of the washing water for a time even after usage of said closet. Such a slow action of the valve is insured by the gradual squeezing of the trapped water out of the confined chamber of the valve. The said valve, therefore, closes automatically and tightly after all of said trapped liquid is expelled.

3,769,638

COMBINATION WHEEL CHAIR AND COMMODE CHAIR

Wayne N. Clanan, 1458 Burns Ave., Detroit, Mich.

Filed Dec. 20, 1971, Ser. No. 210,030
Int. Cl. A47k *11/04, 11/06;* **A61g** *7/04*
U.S. Cl. 4—134 **6 Claims**



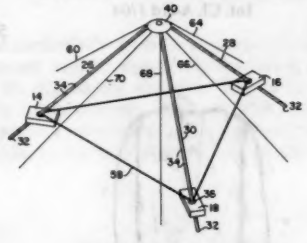
A rectangular chair frame equipped with casters upon the lower ends of its legs is provided with a platform seat containing an elongated central commode opening normally closed by a closure mounted upon a transverse pivot shaft secured to one of the elongated sides of the closure and equipped with a hand lever for swinging the closure from its closed position (FIGS. 1 and 2) to its open position (FIG. 3). Thereupon the patient, without being removed from the chair, when the need arises, can be moved to a position over a conventional toilet bowl. Thereafter, the closure is closed by swinging the pivot shaft hand lever 180° in the reverse direction to consequently swing the closure into closing relationship with the opening. The closure is releasably locked in its closed position by a swinging latch lever pivoted to the underside of the seat platform on either side or on the back (as shown). The chair has L-shaped side arms pivotally mounted upon the upper extensions of the rear legs and having forward ends provided with locking collars movable downward and upward into and out of locking relationship respectively with keeper blocks on the upper ends of the forward legs, whereupon either side arm can be swung sidewise in order to slide the patient off the seat platform onto his bed or vice versa. The seat platform may optionally be provided with raising and lowering mechanism (not shown) beyond the scope of the present invention to bring it upward to the level of the bed mattress. One such arrangement is shown in my co-pending application Ser. No. 823,534, filed May 5, 1969 for Invalid Lift-Transfer Chair which on Apr. 11, 1972 was issued as U. S. Pat. No. 3,654,643.

3,769,639

FLOATING POOL COVER STRUCTURE

John R. Bishop, 223-27 Arch St., Philadelphia, Pa.

Filed June 26, 1972, Ser. No. 266,080
Int. Cl. E04h *3/16, 3/18*
U.S. Cl. 4—172.12 **10 Claims**



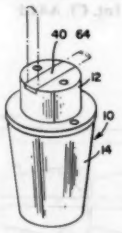
A floating pool cover structure for use in protecting swimming pools including a plurality of at least three angularly spaced legs having height adjusting means provided therein, a plurality of flotation blocks each of which adjustably receives a leg therein, a cable connected to each leg above its associated flotation block, said cable serving the dual purpose of maintaining the height adjustment of each leg and also in maintaining the spacing between the plurality of flotation blocks and a top assembly having sockets in which to receive the top of the spaced legs. A plurality of support lines extend from the top assembly to the pool edge and sufficient cover support lines are employed to fully support a top cover which extends from the top assembly and over the pool edge to prevent the entrance of water or debris into the pool during all periods of use.

3,769,640

DISPENSER

Robert F. Castronovo, Belmont, Calif., assignor to Castronovo & Edwards, d.b.a. Glo-Bowl Products Co., San Francisco, Calif.

Filed Mar. 18, 1971, Ser. No. 125,478
Int. Cl. E03d *9/02*
U.S. Cl. 4—228 **9 Claims**



An automatic device of the form of a dispenser adapted to be placed in the water tank of a toilet is provided. The dispenser includes an extensible hanger strap which is conveniently stored in folded condition in a chamber contained within the dispenser and which may be extended for use and conformed over the top edge of a toilet tank in order to suspend the dispenser in an operative position within the water contained in the tank. The dispenser includes a dispenser top which is snap-fitted to a dispenser bottom in the form of a cup-shaped member adapted to contain therein a

cake of disinfecting and deodorizing cleaner. The normal flushing action of the toilet automatically dispenses a metered amount of dissolved cleaner into the water tank whereupon it mixes with the tank water and is ejected therewith into the toilet bowl to perform its disinfecting, deodoring, and cleaning function.

3,769,641

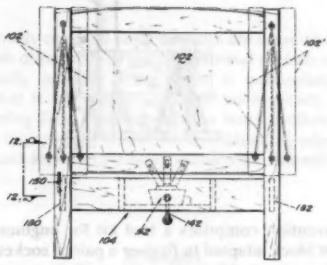
AUTOMATICALLY ROCKING BABY CRADLE

Marie R. Harper, La Mirada, and Maxine R. Blea, Norwalk, both of Calif., assignors to Harper-Blea Incorporated, Santa Fe Springs, Calif.

Continuation-in-part of Ser. No. 213,286, Dec. 29, 1971, abandoned. This application May 30, 1972, Ser. No. 257,571

Int. Cl. A47d *9/02*

U.S. Cl. 5—109 **3 Claims**



A baby crib or cradle adapted to be rocked automatically by an oxcillatory, action motor having the same effect as would be achieved by a mother rocking a crib containing an infant, the crib being pivotally supported at each end thereof to a support rack and stand. The lower portion or bottom of the crib is adapted to be operably connected to the motor. The motor also includes a regulating, reciprocating means for imparting the actuating movement of the crib in a smooth-rocking motion.

3,769,642

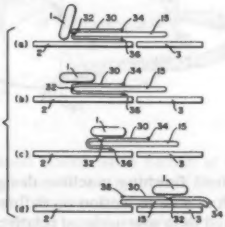
PATIENT TRANSFER METHOD AND APPARATUS

Blair H. Warman, 5 Woodland Rd., Stoneham, Mass.

Continuation of Ser. No. 9,504, Feb. 9, 1970, abandoned. This application Mar. 29, 1971, Ser. No. 128,799

Int. Cl. A61g *7/08, 7/10*

U.S. Cl. 5—81 A **13 Claims**



A patient transfer method and apparatus employs a sheet or continuous band of cloth or similar material wide enough to span the patient's bed and gurney alongside the bed to which the patient is to be transferred with at least the portion of the sheet on the bed doubled back toward the gurney. The patient is moved to lie on the doubled portion and by pulling the edge of a top layer or pushing on the patient, he is transferred as the top of the double layers slides over the bottom layer. The transfer is facilitated by giving the surface of the sheet or band on the inside of the double layer a lower coefficient of friction than the surface on the other side.

3,769,643

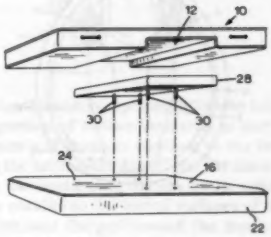
MATTRESSES

Harry M. Adler, 133 Herkimer St., Apt. PH, Hamilton, Ontario, Canada

Filed Jan. 7, 1972, Ser. No. 216,103

Int. Cl. A47c *23/00*

U.S. Cl. 5—351 **4 Claims**



A mattress has a recess in the bottom face thereof and is used in combination with a base member having a rib insert protruding from the top thereof into the said recess; springs in at least the end portions of the base member underlie and are aligned with springs in the corresponding end portions of the mattress. The rib insert is separable from the base member and connected thereto with some free upward movement permitted by the connection.

3,769,644

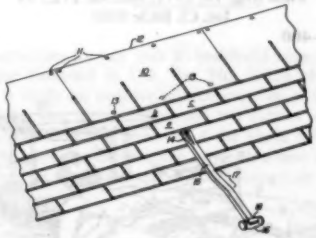
ROOFING TOOL ROOFING KIT, AND METHOD OF USING SAME

Wayne Case, Salt Lake City, Utah

Filed Aug. 25, 1971, Ser. No. 174,708

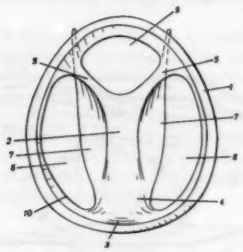
Int. Cl. B25f *1/00*

U.S. Cl. 7—8.1 R **8 Claims**



A novel method of repairing shingle roofs and a versatile roofing tool for use in such a method is disclosed. The method involves removing individual, defective composition or wood shingles and replacing them with a rigid shingle, such as a metal plate. A roofer's hammer having a hammer head at one end and a claw at the other end of a handle having a gradual compound curve near the midlength of the handle is particularly useful for this purpose. It is used by slipping the claw under shingles immediately above the defective shingle until it reaches the nail near the far edge of the shingle. The claw is engaged with said nail and the head of the hammer is forced downward to extract said nail. A metal plate is engaged in a clip alongside said hammer head. The plate is then forced into the space left by the removed shingle.

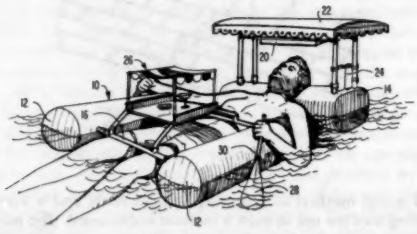
3,769,645
CANOE KNEE-SEAT
Klaus T. Lettman, Duisburg, Germany, assignor to High Performance Products, Inc., Hingham, Mass.
Filed Nov. 30, 1972, Ser. No. 310,778
Claims priority, application Germany, Apr. 1, 1972, G 72 12 461.9
Int. Cl. B63b 29/00
U.S. Cl. 9—7 3 Claims



A knee-seat for Canadian canoes is formed from a cup-shaped, one-piece plastic molding having a ring-shaped sill. A seat section extends obliquely upward from the rear molding wall to the front part of the sill. Shaped seat support walls provide for support of the upper thigh, and leg insertion openings on each side of the seat section facilitate easy entrance and exit. Additional thigh support may be provided by shaped walls on the outside of the leg insertion openings.

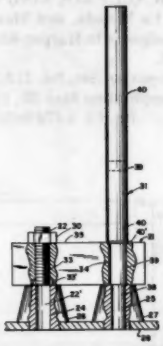
3,769,646
Patent Not Issued For This Number

3,769,647
AQUATIC LOUNGE & TRAY ENSEMBLE
Napoleon A. Basa, 46 Cordillers St., Quezon City, Philippines
Filed Aug. 18, 1971, Ser. No. 172,769
Int. Cl. B63c 9/00
U.S. Cl. 9—400 14 Claims



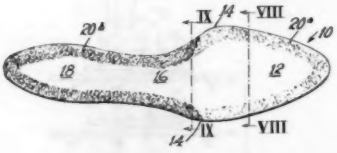
An aquatic lounge-and-tray ensemble adapted to support an occupant in a generally reclining position while in water comprising rigidly interconnected floating means provided with means to support the occupant. The ensemble includes tray means for supporting food, beverage, cigarettes and the like and a suitable shade or canopy means. The ensemble also includes paddle means. The ensemble further comprises readily detachable components wherein the buoy means are inflatable members.

3,769,648
STUD REMOVAL AND TAPPING KIT
Robert D. Haselmo, 315 N. F St., Lompoc, Calif.
Filed Feb. 26, 1971, Ser. No. 119,203
Int. Cl. B23g 1/48; B23p 19/02; B25b 27/14
U.S. Cl. 10—1 R 1 Claim



The invention comprises a tool kit for engines having an alignment block adapted to fit over a pair of socketed press-in type rocker arm stud for acting as a guide in removing one of the press-in type studs, an alignment pin for aligning the block with the remaining stud, so that the block may accurately receive a tap for threading the bore of the removed press-in type stud so as to receive a threaded type stud.

3,769,649
AUTOMATIC SHOE MACHINERY AND OPERATION OF THE SAME
Herman A. Imhof, Hamilton, Mass., assignor to USM Corporation, Boston, Mass.
Division of Ser. No. 829,307, June 2, 1969, Pat. No. 3,579,694.
This application Jan. 4, 1971, Ser. No. 103,790
Int. Cl. A43d 00/00
U.S. Cl. 12—146 B 2 Claims



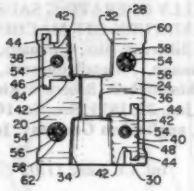
A through feed finishing machine designed to provide an operation such as sole reduction on defined margins or edges of an unattached shoe sole initiated relative to the ball point of the sole. The machine includes pairs of finishing tools, for example, rotatable reducing tools mounted in biased relationship to operate on opposite sides of a sole. Pressure equalizing means are mounted opposite each of the tools to assist in keeping the sole moving along a path of travel through the machine and insure uniform finishing by each of the tools during the finishing operation of the lengthwise margins at predetermined points defined relative to the ball points of the sole. The sole is urged through the machine by drive rolls and is stabilized by holddown rolls acting in pairs.

3,769,650

BATTERY TERMINAL CLEANER AND SHAPER

Carl W. Newell, Glendale, 955 Avonoak Terrace, Calif.

Filed Oct. 20, 1972, Ser. No. 299,376
Int. Cl. B23d *79/08*; B23b *5/16*
U.S. Cl. 15—105 **11 Claims**



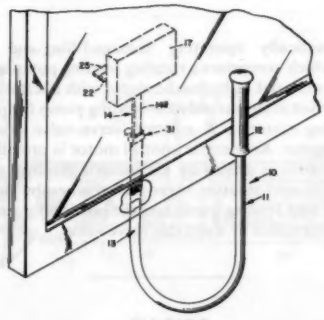
Transversely opposed body sections are assembled forming a body with different size battery terminal sockets opening at longitudinally opposed body ends. A particularly formed blade pocket is transversely adjacent each socket, the blade pockets being face exposed prior to body section assembly and receiving scraping blades therein extending edgewise into the body sockets when the body sections are assembled.

3,769,651

ADJUSTABLE WINDOW CLEANING DEVICE FOR WASHING AND DRYING BOTH WINDOW SURFACES FROM WITHIN THE ROOM

Max Sunskes, 160 W. 231st Street, New York, N.Y.

Filed Sept. 5, 1972, Ser. No. 286,039
Int. Cl. A47l *1/08*
U.S. Cl. 15—121 **4 Claims**



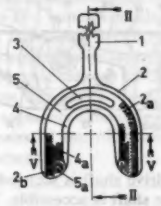
A hollow U-shaped holder has a handle at the end of one arm thereof and has the other arm thereof for the greater part of its length inward from the outer end thereof rectangular in cross-section and receptive of a complementary bar which is the stem of a T-shaped slide. The cross-member portion of the slide has on one side thereof a sponge-like pad and on the other side thereof a window wiper. Each side of a window pane may thus be first washed by the pad and then wiped dry by the wiper, without requiring the user to reach through or get outside the window. Releasable locking means on the open upper end of the said other arm permits withdrawal of the bar to turn it through an angle of 180° and reinsert it into the arm and locking it in any desired extended or retracted position.

3,769,652

CHEWING TOOTHBRUSH

Corrado Rainer, 2 Via Brennero, Bolzano, Italy

Filed Nov. 30, 1971, Ser. No. 203,309
Claims priority, application Italy, Nov. 30, 1970, 4901 A/70
Int. Cl. A46b *1/00, 9/02*
U.S. Cl. 15—167 A **2 Claims**



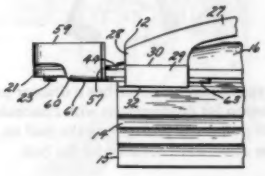
A chewing toothbrush comprising a handle having an arcuately shaped portion of resilient material at one end thereof, which is of a size and shape to conform to the line of teeth of the user when the latter bites down onto the same. The said arcuate portion has upstanding flanges on its edges, which extend generally parallel to the lateral surfaces of the teeth, and projecting from said flanges toward the tooth surfaces are short bristles of soft, elastomeric material, which scrub the surfaces and interstices of the teeth as the user chews on the device.

3,769,653

CLIP FOR WINDSHIELD WIPER BLADE REFILL

Manuel Lopez, Trumbull, Conn., assignor to The Roberk Company, Shelton, Conn.

Filed May 8, 1972, Ser. No. 250,968
Int. Cl. B60s *1/38*
U.S. Cl. 15—250.42 **3 Claims**



A clip structure for use with a windshield wiper blade refill of the type disclosed in U.S. Pat. No. 3,626,544, in which provision is made for positive interconnection of the clip with the metal backing strips supporting the rubber wiper blade. Ease of installation and removal of the blade refill from the claws of the pressure-distributing super structure is facilitated by providing an improved resilient component on the latching means.

3,769,654

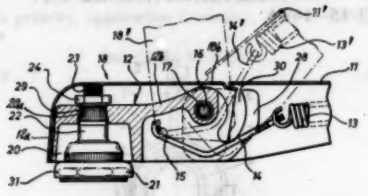
DEVICE FOR FASTENING A WINDSHIELD WIPER ARM ON A DRIVE SHAFT

Reinhard Edele, and Alfred Kohler, both of Bietigheim, Germany, assignors to SWF-Spezialfabrick fuer Autozubehoer Gustav Rau GmbH, Bietigheim, Germany

Filed Dec. 29, 1971, Ser. No. 213,468
Claims priority, application Germany, Feb. 9, 1971, G 71 04 759.1
Int. Cl. B60s *1/34*
U.S. Cl. 15—250.34 **4 Claims**

In a device for attaching a windshield wiper arm to a drive shaft, a receiving member having a socket-shaped first section is fitted over the drive shaft and a cover member and a coupling member are pivotally attached on a common pivot

axis to a second section of the receiving member which extends laterally from its first section. The coupling member extends from the second section away from the first section and is arranged to be secured to the wiper arm. The cover member can be pivoted between a closed position covering the first



section in which the drive shaft is secured and an open position in wh h the drive shaft is accessible. The cover member and coupling member are positioned so that they can be pivoted relative to one another as well as relative to the receiving member.

3,769,655

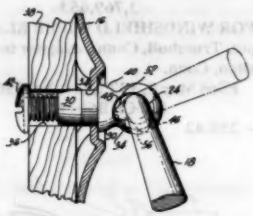
PULL

Robert S. Cartwright, Booneville, N.C., assignor to Stewart-Warner Corporation, Chicago, Ill.

Filed Mar. 18, 1968, Ser. No. 713,571

Int. Cl. A47b *95/02*

U.S. Cl. 16—126 **1 Claim**



The following specification describes a drawer pull bail having a cam lug thereon for engagement with concealed stop surfaces on the door pull posts journalling the bail to prevent excessive upward or downward rotation of the bail.

3,769,656

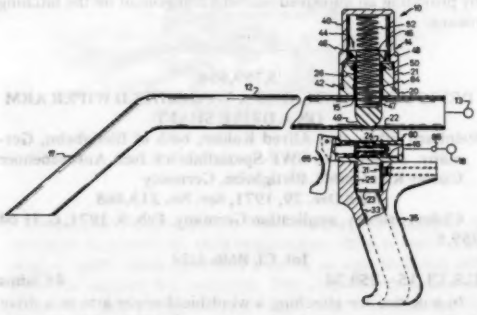
LUNG AND KIDNEY REMOVAL DEVICE

Donald E. Jahnke, 6116 N. 115th St., Menomonee Falls, Wis.

Filed Feb. 9, 1972, Ser. No. 224,824

Int. Cl. A22c *21/00*

U.S. Cl. 17—11 **11 Claims**



A poultry lung and kidney removal device including a vacuum tube, a pressure actuated vacuum valve for controlling the vacuum in the vacuum tube, a trigger actuated air pressure control valve assembly operatively connected to control the vacuum valve and an automatic lubricating system for lubricating the vacuum valve each time the valve is closed.

3,769,657

HYDRAULICALLY OPERATING SAUSAGE-FILLING- AND TURN-OFF MACHINE

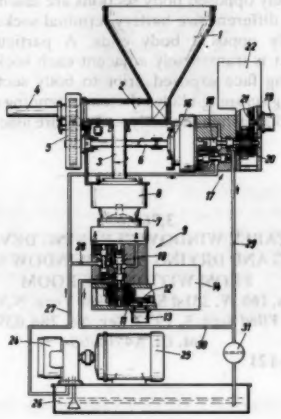
Johannes Muller, Biberach/Riss, Germany, assignor to Firma Albert Handtmann, Metallgusswerk, Armaturen-Und Fleischereimaschinenfabrik, Biberach/Riss, Germany

Filed Jan. 21, 1971, Ser. No. 108,391

Claims priority, application Germany, Jan. 19, 1970, P 20 02 100.5

Int. Cl. A22c *11/02*

U.S. Cl. 17—35 **6 Claims**



A hydraulically operating sausage-filling-and turn-off-machine, which comprises a rotating feeding pump adapted to feed filling material. A hydraulic motor with a settable feeding duration drives intermittently the feeding pump for portioning of the filling material. A rotation servo-valve controls the hydraulic motor. An electric control motor is provided, and a portioning drive is driven by the electric control motor and coupled with said rotation servo-valve, whereby the feeding duration of said feeding pump and the portioning size, respectively, is determined by a settable drive value.

3,769,658

FEEDING MEANS FOR ROLLER GINS

Eugene H. Brooks, Sherman, Tex., assignor to Hardwicke-Etter Company, Sherman, Tex.

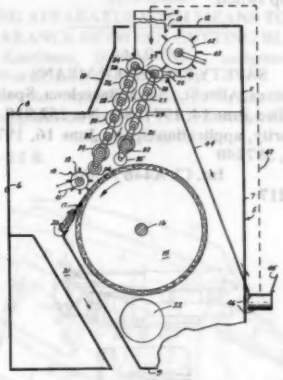
Filed Sept. 27, 1971, Ser. No. 184,069

Int. Cl. D01b *1/06*

U.S. Cl. 19—64.5 **6 Claims**

In order to increase the capacity and durability of a roller gin, the seed cotton customarily supplied intermittently to the ginning region is delivered to this region by an auxiliary feeder device including successive pairs of rollers forming a pathway leading from the inlet to the ginning region. Successive pairs of rollers are caused to rotate at progressively reduced peripheral speeds so that the cotton is condensed and delivered to the roller in a substantially continuous and uniform mat. This results in the drawing of a continuous,

uniform mat of fibers between the stationary blade and the roller which, in turn, permits increasing of the pressure of the

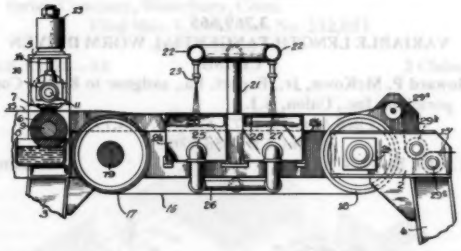


blade against the roller with resultant increase in capacity without undue heating of the roller.

3,769,659
METHOD AND APPARATUS (CONTINUOUS IMPERFORATE PORTIONS ON BACKING MEANS OF OPEN SANDWICH)

Frank Kalwaites, Gladstone, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Continuation of Ser. No. 22,314, March 24, 1970, abandoned.
This application Feb. 10, 1972, Ser. No. 225,327
Int. Cl. D04h *1/00*
U.S. Cl. 19—161 P **2 Claims**

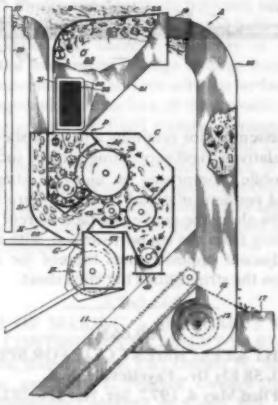


A method and apparatus for producing, from a layer of fibrous material such as a fibrous web, nonwoven fabrics that contain apertures or holes, or other areas of low fiber density, and have a plurality of patterns of groups of fiber segments that alternate and extend throughout the fabric. One form of the method includes the steps of supporting the starting web upon a backing means that is imperforate except for a discontinuous pattern of foraminous portions that have protuberances and troughs alternating across them, then directing fluid rearranging forces substantially uniformly and continuously across the surface of the web, causing some of the fluid streams to strike the imperforate portions of the backing means, and others to strike the protuberances on the foraminous portions of the backing means, to deflect the same, all of the fluid streams ultimately passing through the foraminous portions of the backing means. Each discontinuous foraminous portion extends along the surface of the backing means in each direction a distance that includes at least one protuberance and a trough on each side thereof. The imperforate portions of the backing means may rise above the foraminous portions. The resulting fabric consists of fibers that have been rearranged to provide a first pattern of yarn-like bundles of fiber segments in discontinuous portions of the fabric, which bundles define areas of low fiber density arranged in accordance with the pattern of arrangement of the protuberances on the foraminous portions of the backing means, and a second pattern of groups substantially aligned fiber segments extending between and interconnecting adjacent pairs of the discontinuous portions of the fabric in the first pattern.

3,769,660
BUR EXTRACTOR

Roland J. Schuette, Jr., Slaton, Tex., assignor to Triangle Mfg. Co., Inc., Slaton, Tex.

Continuation of Ser. No. 850,831, Aug. 18, 1969, abandoned.
This application May 23, 1972, Ser. No. 256,192
Int. Cl. D01g *1/00*
U.S. Cl. 19—202 **1 Claim**



A pneumatic conveyor moves unprocessed cotton upward through a generally inverted U-shaped inlet chute. Included in the chute is an air separator that reduces air flow in a low velocity leg through which unprocessed cotton gravitates toward a bur extractor. Within the low velocity leg is a throat region and access door to facilitate manual removal of large contaminants like sagebrush. A fan, discharging air tangent to one wall of an outlet chute, generates a suction in a space defining an outlet in the bur extractor for conveying processed cotton to storage.

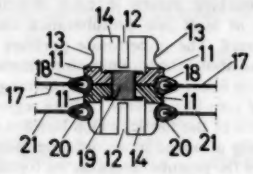
3,769,661
FASTENING DEVICE

Sigurd Walter Bengtsson, Bruksgatan-17, Goteborg, Sweden

Filed Apr. 8, 1971, Ser. No. 132,332
Claims priority, application Sweden, Apr. 13, 1970, 5027/70
Int. Cl. A44b *17/00*
U.S. Cl. 24—73 PF **15 Claims**

A spring-fastener for interconnecting layers of tent cloth and the like comprises two equal-sized resilient fastening heads which are fixedly interconnected and which project in opposite directions, there being an anchoring portion between said heads, each of which heads, at opposite sides of said

anchoring portion, extending from a neck of smaller diameter than the largest diameter of the heads for selective and releaseable connection by either of said fastening heads onto an annular securing member or eyelet secured to the layer of cloth.



3,769,662

VINYL TOP RETAINER ASSEMBLY

Engelbert A. Meyer, Union Lake, Mich., assignor to USM Corporation, Boston, Mass.

Filed July 10, 1972, Ser. No. 270,093

Int. Cl. A44b *21/00*; **F16b** *19/00*

U.S. Cl. 24—73 HS **4 Claims**

A fastener assembly for retaining a flexible sheet of vinyl or the like to a relatively rigid supporting surface such as the roof of an automobile, comprising an elongate strip of longitudinally curved resilient material having a plurality of spaced prongs or barbs along the convex surface thereof and a pair of studs upstanding from the support surface, with the strip having means adjacent opposite ends thereof for engaging the studs to tension the strip against the vinyl sheet.

3,769,663

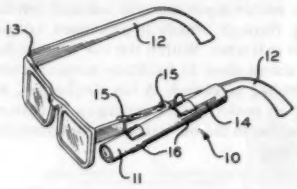
FLASHLIGHT ATTACHMENT CLIP FOR SPECTACLES

Theodore Perl, 58 Ely Dr., Fayetteville, N.Y.

Filed May 4, 1972, Ser. No. 250,282

Int. Cl. A44b *21/00*; **F21v** *33/00*

U.S. Cl. 24—81 AD **3 Claims**



A clip for attaching a small flashlight to one of the temples of a spectacle frame is made in two parts, one part being adapted to be mounted on a spectacle temple and the other part supports a small penlight. The first part has a temple-engaging portion and two clips projecting therefrom to closely embrace a temple. The light support part has a light-engaging portion having two pairs of substantially semicircular spring arms for embracing the substantially round penlight and has a projecting headed stud at one end adapted to be engaged in a supporting socket which is supported by the temple-engaging portion. The light-engaging portion has a spring-tongue bent back against itself adapted to adjustably and frictionally engage a vertically disposed projection supported by the temple-engaging portion. When the flashlight used has a pocket clip switch adapted to turn the light on when pressed, the light may be controlled by turning it in the encircling spring arms to depress the clip switch.

3,769,664

SAFETY FASTENER MEANS

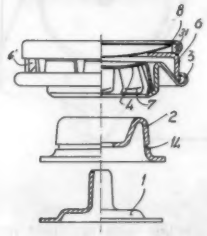
Pedro Pere Parera, Alba St., No. 3, Barcelona, Spain

Filed June 14, 1971, Ser. No. 152,910

Claims priority, application Spain, June 16, 1970, 380812; Jan. 14, 1971, 387240

Int. Cl. A44b *17/00*

U.S. Cl. 24—217 **3 Claims**



A safety fastener for joining two laminae, comprising a male element having two pieces fixed together for holding one of the laminae therebetween and a female element releasably connectible to the male element. The female element is formed as an inverted cup with its base arched and susceptible to pass from concave to convex and provided with projecting teeth adapted to engage an annular slot in the male element. The female element is confined with free-play between an exterior tubular piece and an intermediate tubular piece. A concave disc is supported adjacent the base of the female element, whereby the fastener is opened by finger pressure exercised on the convexity of the female element. A ring is provided for fixing the female element to the other laminae.

3,769,665

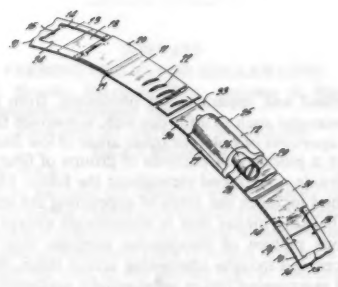
VARIABLE LENGTH TANGENTIAL WORM DRIVEN CLAMP

Howard P. McKown, Jr., Export, Pa., assignor to Breeze Corporations, Inc., Union, N.J.

Filed Aug. 30, 1972, Ser. No. 284,777

Int. Cl. B65d *63/02*

U.S. Cl. 24—274 R **5 Claims**



A three part interlocking tangential worm driven clamp in which the desired size of the clamp is selectively formed by a

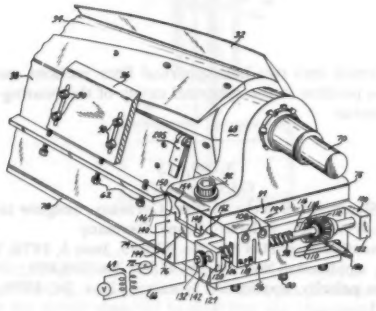
length of band material having a series of spaced openings therein. A worm and housing unit is interlocked with one end of the band by means of the band openings and a slotted take up member is coupled to the opposite end of the band.

3,769,666

SHEARING APPARATUS WITH MEANS TO DETECT CLEARANCE BETWEEN CUTTING BLADES

Aaron M. Kaufman, Queens, N.Y., assignor to Reliable Machine Works, Inc., Brooklyn, N.Y.

Division of Ser. No. 40,609, May 26, 1970, Pat. No. 3,683,468.
This application Jan. 21, 1972, Ser. No. 219,907
Int. Cl. D06c *13/00*
U.S. Cl. 26—15 R **4 Claims**



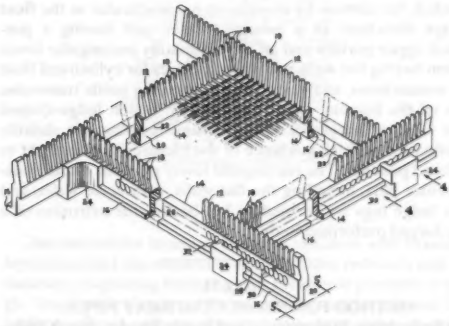
A shearing apparatus for automatically shearing natural and/or synthetic fibrous material comprises a rotating blade and a fixed blade positioned in a cutting relationship with a minimal clearance space therebetween. Means are provided to accurately measure that clearance space while the apparatus is in operation. Means are also provided to accurately adjust the relative position of the cutting blades during the operation of the apparatus thereby to reduce the clearance space to a desired amount.

3,769,667

ADJUSTABLE WEAVING LOOM

Joseph Cooper, Westport, Conn., assignor to Scovill Manufacturing Company, Waterbury, Conn.

Filed Mar. 6, 1972, Ser. No. 232,051
Int. Cl. D03d *29/00*
U.S. Cl. 28—15 **2 Claims**



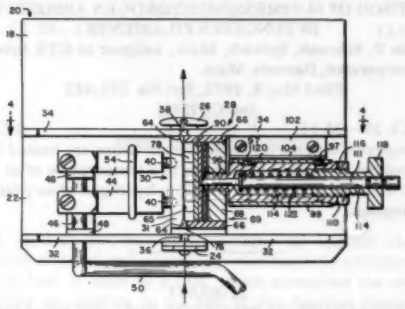
An adjustable weaving frame has identical side elements each comprising an elongate portion with upward pins and a U-shaped clamp molded integral with the elongate portion. In use, the clamp receives the elongate portion of the adjacent side element. Means are provided to releaseably hold adjacent side elements in the selected location.

3,769,668

COMBINATION TENSION CONTROL AND SLUB CATCHING DEVICE

Samuel L. Abbott, Wilton, N.H., assignor to Abbott Machine Co. Inc., Wilton, N.H.

Filed June 2, 1972, Ser. No. 258,993
Int. Cl. D01h *13/22*
U.S. Cl. 28—64 **23 Claims**



A combination tension control and slub catching device wherein there are confronting fixed and movable members provided with confronting surfaces between which the yarn moves. The movable member is yieldably held engaged with the fixed member and there is an array of parallel bars mounted on the fixed member edge to edge transverse of the direction of movement of the yarn with the surfaces thereof at one side engaged with the surface of the movable member. An adjustable support on the fixed member arranged in engagement with the ends of the bars at the opposite sides limits displacement of the bars relative to the surface of the movable member, and a spring-pressed plunger supported on the fixed member in engagement with a pressure plate applies pressure to the bars in a direction to press them against the surface of the movable member.

3,769,669

METHOD OF MAKING A HELICALLY CRIMPED CONTINUOUS FILAMENT YARN

Joseph A. Self, Baton Rouge, La.; Gerald W. Sovereign, Gulf Breeze, Fla., and Alton E. Peacock, Orange Court, N.C., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 772,766, Nov. 1, 1968, Pat. No. 3,663,352.
This application Feb. 22, 1972, Ser. No. 228,144
Int. Cl. D02g *1/00*
U.S. Cl. 28—72.1 **2 Claims**

One side of a drawn homogeneous filament having at least 17 percent boiling water shrinkage is heated above its melting

point while under high tension. The filament is then prebulked while under substantially no tension by being exposed to hot air at a temperature above the yarn glass transition temperature, soon after the initial heat treatment, and preferably before being wound. This produces a tighter crimp when the yarn is later subjected to hot water.

3,769,670

METHOD OF SUPPRESSING HYDROGEN ABSORPTION IN TUNGSTEN FILAMENTS

Martin P. Schrank, Ipswich, Mass., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Filed May 8, 1972, Ser. No. 251,422

Int. Cl. H01j

U.S. Cl. 29—25.11 **1 Claim**

Tungsten filaments for incandescent lamps are heated in an atmosphere of hydrogen bromide at a temperature of at least about 1,500°C in order to suppress hydrogen absorption by the tungsten.

3,769,671

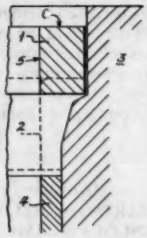
MANUFACTURE OF RINGS FOR ROLLING BEARINGS

Edward Ronald Knapp, Duston, England, assignor to The Timken Company, Canton, Ohio

Filed Nov. 22, 1971, Ser. No. 201,100

Int. Cl. B23p *11/00*; B21h *1/12*

U.S. Cl. 29—148.4 R **8 Claims**



A method of manufacturing rings for rolling bearings, particularly tapered roller bearings, in which a ring of rectangular section made by a hot rolling operation is subjected to cold forming by impact whereby to produce a ring form of non-rectangular section having substantially the shape of the required bearing rings. The ring form so produced is machined on one circumferential face to form the race and on one end, preferably the narrower end, to control the axial length, and may then be hardened.

3,769,672

METHOD OF MAKING AN IMPROVED TEFLON-LINED SPHERICAL BEARING

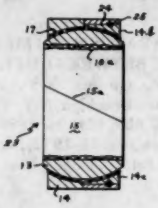
Phillip R. Eklund, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed July 31, 1972, Ser. No. 276,338

Int. Cl. B23p *11/00, 7/00*

U.S. Cl. 29—149.5 B **7 Claims**

A method of repairing and retrofitting the teflon fabric liner of a sperical and/or self-aligning bearing, that has separated due to poor bonding with the bearing surface, with a metal-backed, teflon liner that includes a metal backing and a teflon skiving heat and pressure bonded thereto, and reinforced with a mechanical interlock. The metal-backed, teflon liner is initially formed into two hemispherical liner sections each inserted in position in the spherical cavity of the bearing-outer race member.



3,769,673

GATE VALVE

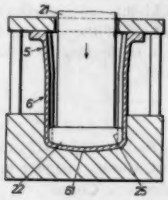
Walter Siepmann, Belecke/Mohne, Germany, assignor to Siepmann-Werke KG, Belecke/Mohne, Germany

Continuation-in-part of Ser. No. 43,095, June 3, 1970. This application Nov. 19, 1971, Ser. No. 200,459

Claims priority, application Germany, Nov. 24, 1970, P 20 57 746.2

Int. Cl. B21k *1/24*

U.S. Cl. 29—157.1 R **3 Claims**



Gate valves having a valve closure member slidably mounted, for closure by movement perpendicular to the fluid passage direction, in a housing center part having a pot-shaped upper portion and an approximately rectangular lower portion having flat walls including recesses for cylindrical fluid flow connections, and guide ledge lugs on the inside transverse walls of the housing center portion, on which ledge-shaped guide lugs on the plates of the closure member are slidably mounted for positive guidance of the closure member right to its closed position. The rectangular lower portions of the housing center part, including the flat walls, transverse walls, and guide ledge lugs are formed by hot backwards extrusion of a drop-forged preformed body.

3,769,674

METHOD FOR PRODUCING HEAT PIPES

John Droughton, Moorestown, and Robin Rhodes, North Plainfield, both of N.J., assignors to Isothermics Incorporated, Clifton, N.J.

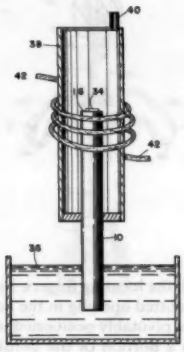
Filed Oct. 10, 1972, Ser. No. 295,927

Int. Cl. B21d *53/02*; B23p *15/26*

U.S. Cl. 29—157.3 R **6 Claims**

A method for producing heat pipes comprising the steps of providing a heat pipe with one end closed in the ordinary

fashion, inserting the closed end of the heat pipe into a solution whose temperature is maintained below the triple point of the working fluid of the heat pipe charging the heat pipe with the working fluid which freezes near the bottom of the heat pipe, capping the open end of the heat pipe with a plug having a through passage, placing solder braze or weld material on



the plug, evacuating the heat pipe to a desired low pressure, and activating heating means such as an induction coil to cause the solder material to flow into the clearance between the heat pipe wall and the plug and to flow into the passage in the plug to seal the formerly open end of the heat pipe with a positive metal seal.

3,769,675

METHOD FOR BRAZING ALUMINUM RADIATORS

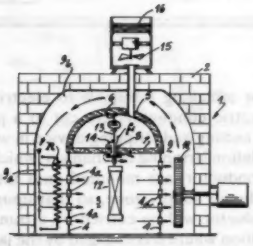
Andre Chartet, Meudon, France, assignor to Societe Anonyme des Usines Chausson, Asnieres, France

Filed Sept. 4, 1970, Ser. No. 69,593

Claims priority, application France, Sept. 22, 1969, 6932199

Int. Cl. B21d *53/02*

U.S. Cl. 29—157.3 R **19 Claims**



The method for brazing aluminum radiators with brazing alloys comprises the steps of suspending said radiators and continuously displacing them through successive portions of a single lengthwise elongated furnace cavity with rear and front surfaces of said radiators directed at right angles with respect to successive streams of hot gas blown into each of said successive portions of said furnace at different temperatures and in adjacent relationship therebetween.

This disclosure relates to a novel method for brazing radiator cores all the parts thereof being made of aluminum or alluminum alloys and a part at least thereof being plated with a brazing alloy.

3,769,676

METHOD FOR ATTACHING APPLIQUE OR APPLIED CHAPTERS FORMED OF METAL AND EQUIPPED WITH A CIRCULAR-CYLINDRICAL FOOT PORTION TO A DIAL

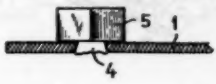
Gilbert Feller, Le Locle, Switzerland, assignor to Metalem S.A., Le Locle, Switzerland

Filed Apr. 19, 1971, Ser. No. 135,176

Claims priority, application Switzerland, Apr. 24, 1970, 6165/70

Int. Cl. B23p *13/00*

U.S. Cl. 29—177 **12 Claims**



A method for attaching applique or applied chapters formed of metal and possessing a substantially circular-cylindrical foot or stem to a dial, which comprises the steps of forming an opening in the dial at the location intended to receive the applied chapter, this opening possessing a non-circular cross-sectional configuration, with the smallest dimension thereof at least being as large as the diameter of the foot or stem of the applique or applied chapter. Thereafter, the stem of the chapter is introduced into the opening, and then the stem is deformed from the opposite face of the dial so that it partakes the configuration of the opening.

3,769,677

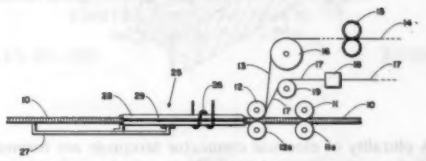
REGISTERING OF TRANSVERSELY CORRUGATED ELEMENTS

Dan Bryan Davis, Ile Perrot, and Bretislav Paul Zuber, Montreal, both of Quebec, Canada, assignors to Northern Electric Company, Limited, Montreal, Quebec, Canada

Filed Feb. 25, 1972, Ser. No. 229,320

Int. Cl. B23p *19/00*

U.S. Cl. 29—200 P **4 Claims**



Apparatus for correctly registering a transversely corrugated butt strap in position over the butt joint of a corrugated butt joint tube. Strap and tube are passed between guide rolls which progressively force the strap and tube into correct registration -for soldering.

3,769,678

SPLICER FOR REINFORCING BARS

Ronald Eric Marsden, Mississauga, Ontario, Canada, assignor to Stricon Products Limited, Mississauga, Ontario, Canada

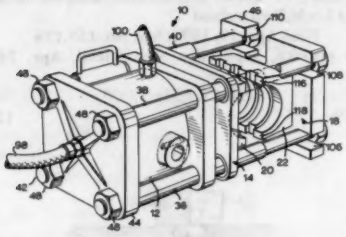
Filed May 10, 1972, Ser. No. 252,018

Int. Cl. B23p *19/00, 17/00, 11/02*

U.S. Cl. 29—200 B **6 Claims**

The invention provides a method and apparatus for connecting reinforcing bars such that tensile or compressive stress can be transmitted from one of the bars to the other of the bars. The apparatus includes an actuator, an anvil and a mova-

ble jaw connected to the actuator for movement towards the anvil. The anvil and movable jaw are shaped to fit snugly



about the sleeve so that when the actuator applies a force, the sleeve is deformed between the movable jaw and the anvil.

3,769,679

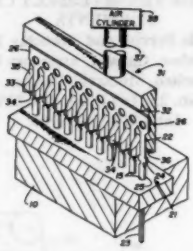
APPARATUS FOR MANUFACTURING CONNECTOR TERMINALS

Jerry A. Kendall, Carrollton, Tex., assignor to Elab Corp., Dallas, Tex.

Division of Ser. No. 39,089, May 20, 1970, Pat. No. 3,676,926. This application July 5, 1972, Ser. No. 269,094

Int. Cl. H05k *13/04*

U.S. Cl. 29—203 B **4 Claims**



A plurality of elecrical connector terminals are formed as part of a common metal strip. The terminals are first inserted into prepunched holes in a mounting board while they are still attached to one another as part of the strip. The terminals are next all press fit simultaneously into the mounting board holes. The strip which connects them together is then broken free and discarded to separate the terminals from one another and leave the individual connector terminals mounted in the board.

3,769,680

CONNECTOR HOUSING REMOVAL TOOL

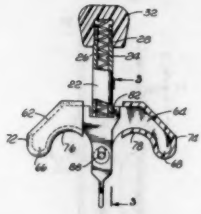
John William Anhalt, La Crescenta, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed May 26, 1972, Ser. No. 257,098

Int. Cl. H05k *3/04*

U.S. Cl. 29—203 H **11 Claims**

A connector tool for removing electrical connector housings from a mounting member wherein little or no clearance space exists between adjacent housing members. The housing contains a slotted opening for insertion of a printed circuit board and has a surface adjacent the opening which limits movement of one end of the contacts contained in the housing. The tool comprises locating fingers for correctly positioning the tool in the housing. The locating fingers normally rest upon the mounting member upon insertion of the tool in the housing. A shaft member having a spring member therein is



formed integral with the locating fingers. Pawl members which are inserted in the slotted opening in the housing are movable by means of handles pivotably positioned in the shaft member wherein they grasp a portion of the housing surface. Dowel means are used to interconnect the handles, the dowel means being movable in a slot formed in the shaft.

3,769,681

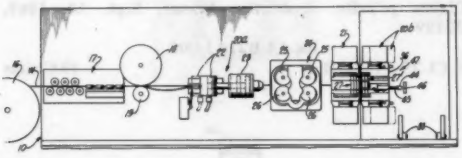
APPARATUS FOR ATTACHING TERMINALS TO ELECTRIC CONDUCTORS

Floyd G. Eubanks, deceased, late of 2665 Las Lunas, Pasadena, Calif.; by Ellen M. Eubanks, Executrix

Filed Mar. 23, 1971, Ser. No. 127,191

Int. Cl. H01r *43/04*

U.S. Cl. 29—203 D **19 Claims**



Apparatus for attaching terminals to electric conductors, wherein the electric conductors are cut to a predetermined length in a wire cutting and stripping device in which stripping jaws of the insulation stripping mechanism, which grip the cut-off length of conductor, are mounted on a tiltable movable panel in a conductor supply zone, so that upon being tilted, the cut-off conductor will be carried by a translatory movement into a position where it is engaged by the jaws of a pair of conveyor fingers and carried to a terminal attaching zone where an end of the cut-off conductor is positioned in a conductor end receiving portion of a terminal which is then secured to the conductor end by the operation of appropriate dies embodied in the associated terminal attaching device.

3,769,682

DRIVING TOOL FOR FLOOR TAP INSERT ELEMENTS

Charles M. Carver, 435 19th Ave., San Francisco, Calif.

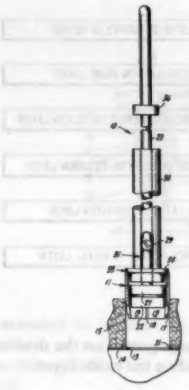
Filed July 6, 1971, Ser. No. 159,759

Int. Cl. B23p *19/02*

U.S. Cl. 29—255 **5 Claims**

A floor tap insert installing tool characterized by a hammer element movable along an elongated staff and arranged with

an anvil assembly at one end whereby the hammer element may be selectively positioned to strike one or the other of two



portions of the anvil assembly so as to apply blows to either of two portions of a floor tap insert being installed.

3,769,683

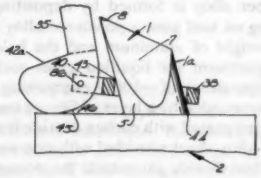
MEANS FOR REMOVAL AND INSTALLATION OF BITS IN MINING AND DIGGING MACHINERY

Claude B. Krekeler, Cincinnati, Ohio, assignor to The Cincinnati Mine Machinery Co., Cincinnati, Ohio

Continuation-in-part of Ser. No. 842,791, June 30, 1969, Pat. No. 3,622,206, which is a continuation-in-part of Ser. No. 753,398, Aug. 19, 1968, abandoned. This application Nov. 16, 1971, Ser. No. 199,259

Int. Cl. B23p *19/04*

U.S. Cl. 29—267 **15 Claims**



Tools for the installation and removal of bits in mining and digging machinery, wherein the bits are characterized by the fact that that portion of the bit body which extends outwardly of the bit mounting means and is engageable by a tool during the extraction process has a smooth, uninterrupted surface free of shoulders, notches, grooves and the like. The tool comprises an elongated handle having thereon a surface capable of administering blows to the cutting end of the tool for installation purposes. One end of the tool has a pivoting assembly affixed thereto which is capable of being placed about the bit body and engaging the bit body in a wedging action when a pulling force is applied to the assembly by the tool handle. The tool handle may be provided with cam surfaces adapted to engage the exterior surface of the bit mounting means and to aid in the application of the pulling force on the pivoted assembly.

3,769,684

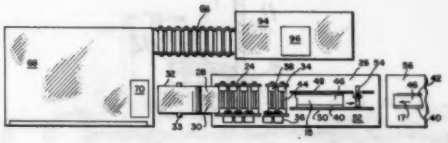
METHOD OF FIRE DAMPER FABRICATION

John C. Kurz, Red Lion & Gantry Rds., Philadelphia, Pa.

Filed May 30, 1972, Ser. No. 258,065

Int. Cl. B23p *17/00*

U.S. Cl. 29—412 **10 Claims**



The method of fabricating fire dampers which includes the steps of unrolling first sheet strip material from a coil and leading the sheet material through a first roll form to form a continuous blade configuration of a first size, feeding the blade configured strips in a first direction to a saw to cut the strip into segments, feeding the segments in the reverse direction to the saw to cut to the desired blade length, unrolling second sheet material and employing the said first roll form to roll blades of a second size, unrolling third sheet material and employing the first roll form to roll a frame length of a first size corresponding to the first blade size, unrolling fourth sheet material and die cutting blanks to predetermined length, feeding the blanks to a second roll form to form flanges in the blanks corresponding to the second blade size, and notching flanges of the frame at the corners thereof to thereby permit fabrication of fire dampers of two basic sizes in a minimum period of time and with a minimum of equipment and space requirements.

3,769,685

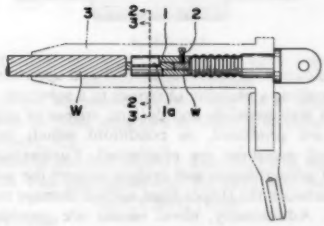
METHOD OF CLAMPING STEEL CORE ALUMINUM STRANDED WIRES

Hiroshi Noda, Shinagawa-ku, Tokyo, Japan, assignor to Sanwa Tetsuki Kougiyou Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 5, 1971, Ser. No. 186,719

Int. Cl. B23p *3/00, 25/00*

U.S. Cl. 29—459 **3 Claims**



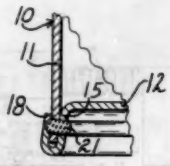
A method of clamping steel core aluminum stranded wires by inserting a steel core wire into a steel core wire inserting hole in a steel sleeve provided with a plurality of axial slits on the outer wall of the steel core wire inserting hole and having a through screw hole directed to the axis near the base of the slits, screwing a push screw to be screwed into the above mentioned screw hole to press the steel core wire with the tip so that the head of the screw may be hidden in the screw hole, inserting this steel sleeve into a cylindrical part of an aluminum sleeve into which it can be inserted with a slight clearance and compressing the aluminum sleeve on the outer periphery.

3,769,686

PROCESS FOR SECURING A HEAD TO A CONTAINER

James A. Massey, 641 No. 1 Taulouse Ln., Memphis, Tenn.

Filed Apr. 24, 1972, Ser. No. 246,882
Int. Cl. B23k *31/02*
U.S. Cl. 29—470.5 2 Claims



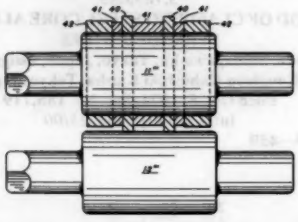
The continuous side wall of a metal container is secured to a head therefor by forming a peripheral groove in the head for receiving an end of the side wall with adjacent sides of the groove at opposite sides of and engaging the end of said side wall. The end of the continuous side wall and the adjacent sides of the groove are bent concomitantly and laterally as a unit. A continuous weld is then applied around the peripheral groove to weld the end of the continuous side wall to a side of the groove.

3,769,687

METHOD OF ROLL PRESSURE BONDING STRIPES TO A SUBSTRATE

Larry M. Kozak, Tarentum, and Raymond L. Southern, Lower Burrell, both of Pa., assignors to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 824,205, May 13, 1969, Pat. No. 3,632,043. This application June 11, 1971, Ser. No. 152,319
Int. Cl. B23k *31/02*
U.S. Cl. 29—471.1 13 Claims



The application describes a method and apparatus for roll pressure bonding a plurality of stripes to a substrate. Through unique roll arrangements and designs, stripes of controllable thickness are produced, as conditions which cause non-uniform roll pressures are eliminated. Furthermore, these unique roll arrangements and designs protect the substrate in the areas between the stripes from surface damage such as roll scratching. Additionally, novel means are provided which both guide and heat the materials.

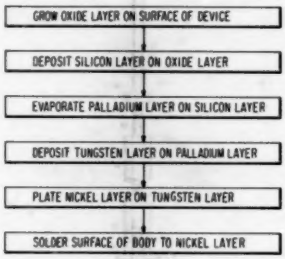
3,769,688

METHOD OF MAKING AN ELECTRICALLY-INSULATING SEAL BETWEEN A METAL BODY AND A SEMICONDUCTOR DEVICE

Sebastian William Kessler, Jr., and Robert Franklin Keller, both of Lancaster, Pa., assignors to RCA Corporation, New York, N.Y.

Filed Apr. 21, 1972, Ser. No. 245,926
Int. Cl. B23k *31/02*
U.S. Cl. 29—473.1 2 Claims

A metal body is sealed to a semiconductor device by producing an insulator layer on a surface of the device, producing a semiconductor layer on the insulator layer, and bonding a surface of the body to the semiconductor layer.


GROW OXIDE LAYER ON SURFACE OF DEVICE
DEPOSIT SILICON LAYER ON OXIDE LAYER
EVAPORATE PALLADIUM LAYER ON SILICON LAYER
DEPOSIT TUNGSTEN LAYER ON PALLADIUM LAYER
PLATE NICKEL LAYER ON TUNGSTEN LAYER
SOLDER SURFACE OF BODY TO NICKEL LAYER

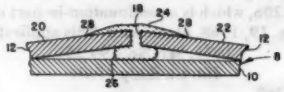
Preferably, an oxide layer is grown on the device surface, and a silicon layer is deposited on the oxide layer.

3,769,689

METHOD OF MAKING PRESSURE-TIGHT SEAL FOR SUPER ALLOY

Robert E. Little, Yorktown, Va., assignor to The United States of America as represented by the Secretary of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jan. 12, 1972, Ser. No. 217,213
Int. Cl. B23k *31/02, 35/24*
U.S. Cl. 29—498 5 Claims



A pressure-tight seal for a joint formed by abutting edges of sheets of super alloy is formed by depositing by means of flame spraying on said joint a powdered alloy comprising 4.5 percent by weight of aluminum and the balance nickel. A storage compartment for liquified gases such as hydrogen stored at temperatures of −400°F comprising a storage tank for said gas surrounded by a layer of fibrous insulation material which is impregnated with carbon dioxide frost and an outer skin of super alloy sheet provided with one-way check valves to release carbon dioxide gas outside the storage compartment when a pressure of ½ to 1 pound per square inch is reached is disclosed. Joints of the outer skin of super alloy sheet are sealed by flame spraying them with the powdered nickel aluminum alloy to a thickness of about 0.040 inch.

3,769,690

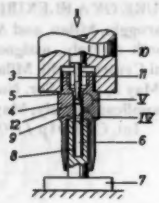
METHOD OF MANUFACTURING HIGH PRESSURE HOSE COUPLING

Karl Brand, Ebern, Germany, assignor to Kugelfischer Georg Schafer & Co., Schweinfurt, Germany

Division of Ser. No. 113,839, Feb. 9, 1971. This application Jan. 31, 1972, Ser. No. 222,410
Claims priority, application Germany, Apr. 1, 1970, P 20 15 552.6
Int. Cl. B21d *39/00*; B23p *11/00*
U.S. Cl. 29—520 5 Claims

A coupling for high pressure hose in which an annular portion of an inner member is secured to a bore of an outer

member along two separate circumferential regions. In the method of making the coupling the inner member is placed in a central recess in an anvil which has a frusto-conical annular upper end face that is engaged by an end wall of the outer



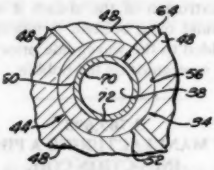
member. A mandrel is forced into the bore of the inner member to deform its wall into engagement with the wall of the bore of the sleeve both at the end of the mandrel and at the end of the anvil.

3,769,691

METHOD OF MAKING TUBULAR LAMINATED ARTICLE

Otto V. Puzik, Willoughby, assignor to Willow Hill Industries, Inc., Willoughby, Ohio

Filed Apr. 8, 1971, Ser. No. 132,425
Int. Cl. B21d *39/00;* **B23p** *11/02*
U.S. Cl. 29—523 **3 Claims**



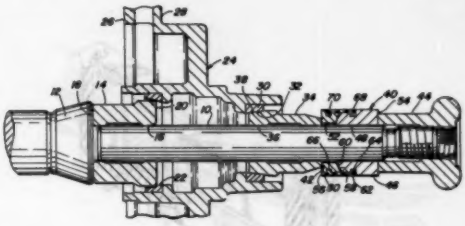
A tubular laminated article constructed in accordance with the present invention can be adopted to function in many different ways in different assemblies. Included among these assemblies is a crawler track assembly having a laminated bushing with a relatively hard, wear resistant inner layer and a relatively ductile outer layer which is capable of withstanding impact or shock loads. The tubular laminated article can advantageously be used as a pressure tube in an impact absorber assembly which absorbs impact forces when a vehicle encounters an accident. The laminated bushing and pressure tube are both made by plastically expanding tubular metal blanks, one or more at a time, in a die cavity at a temperature below the crystallization temperature of the metal. Expanding the blanks moves surfaces of the blanks into tight abutting engagement to form a tubular laminated article having firmly joined layers with accurately dimensioned inner and outer surfaces. One layer of the tubular laminated article may be formed of a metal having a relatively high hardenability. Another layer of the article may be formed of a metal having a relatively low hardenability. Therefore, a subsequent heat treating results in the formation of a hard layer disposed adjacent to a ductile layer. Of course, the number and arrangement of hard and ductile layers could be varied.

3,769,692

SPACER ASSEMBLY

Wallace F. Mitchell, Arlington Heights, Ill., assignor to Ammco Tools, Inc., North Chicago, Ill.

Division of Ser. No. 66,530, Aug. 24, 1970, Pat. No. 3,663,045. This application Nov. 9, 1971, Ser. No. 197,179
Int. Cl. B23q *7/00*
U.S. Cl. 29—559 **2 Claims**



A method of mounting a brake disc on a lathe for resurfacing the faces thereof employs a self-centering spacer used in conjunction with a pair of adapter cones to prevent bending of the arbor when the cones are tightened against the disc.

3,769,693

PROCESS FOR PREPARING NUCLEAR HARDENED SEMICONDUCTOR AND MICROELECTRONIC DEVICES

Harold T. Cates, and Ray E. Darling, both of Orlando, Fla., assignors to Martin-Marietta Corporation, New York, N.Y.

Filed July 16, 1971, Ser. No. 163,457
Int. Cl. B01j *17/00*
U.S. Cl. 29—574 **5 Claims**

A process for preparing nuclear hardened semiconductor or microelectronic devices comprising:

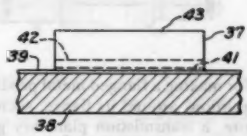
1. determining the electrical characteristics of semiconductor or microelectronic devices;
2. designating the electrically acceptable semi-conductor or microelectronic devices;
3. exposing said acceptable semiconductor or micro-electronic devices to a neutron environment;
4. determining the electrical characteristics of said exposed semiconductor or microelectronic devices; and
5. annealing the neutron environment electrically acceptable semiconductor or microelectronic devices is disclosed.

3,769,694

OHMIC CONTACT FOR GROUP III-V P-TYPE SEMICONDUCTORS

Neil E. Collins, Richmond Heights, and Ira E. Halt, Chesterland, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 101,971, Dec. 28, 1970, Pat. No. 3,684,930. This application Apr. 18, 1972, Ser. No. 245,283
Int. Cl. B01j *17/00*
U.S. Cl. 29—589 **3 Claims**



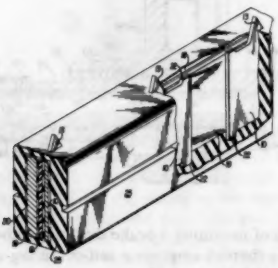
A combination of gold-germanium or gold-silicon alloy and zinc or other metallic Group II element provides an electrical contact and low-temperature bonding material for p-type semiconductors of Group III–V such as gallium arsenide.

3,769,695

STATIC ELIMINATOR

Thomas L. Price, Melbourne, and Robert M. Montgomery, Indialantic, both of Fla., assignors to Harris-Intertype Corporation, Cleveland, Ohio

Filed July 6, 1971, Ser. No. 159,992
Int. Cl. H05f 3/00
U.S. Cl. 29—592 3 Claims



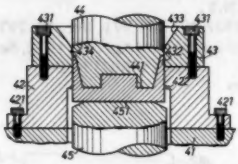
A static eliminator is fabricated by stamping a chain of linked equally spaced electrically conductive elements from sheet metal stock, each element including a projecting point; placing the chain of linked elements in longitudinally coextensive, dielectrically spaced relationship with a ribbon cable capable of carrying high voltage levels; constraining the chain and the cable to that placement while severing the links between elements so that each element is separated from the adjacent elements but retains the same spacing relative thereto and also retains the same spacing relative to the cable; and encapsulating the cable and the elements in that constrained configuration in a rigid mass of electrically insulative material from which the points of the elements project in equally spaced array.

3,769,696

PROCESS FOR MAKING A FLANGED METAL PRODUCT HAVING RAISED PORTIONS AROUND ITS FLANGE

Taikichi Awano, and Yoshihiro Oishi, both of Nagoya, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi-ken, Japan

Filed May 7, 1971, Ser. No. 141,334
Claims priority, application Japan, May 12, 1970, 45/40831
Int. Cl. B23p 17/00
U.S. Cl. 29—598 14 Claims



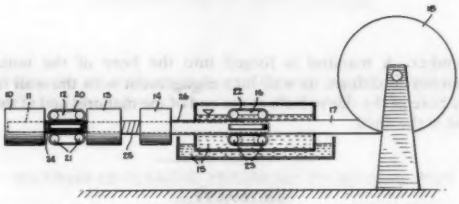
A process for making a flanged metal product having one or more raised portions around its flange, such as an alternator rotor pole core, a transmission planetary gear, or the like, comprising first forming a semi-finished product having raised portions which are thicker, shorter and less steeply inclined with respect to the flange than the corresponding parts of the finished product by applying pressure by a punch directly to melted metal in a die cavity until the metal solidifies, and then forming the finished product by squeezing the semi-finished product into a die cavity having the same shape as the desired finished product to bend the raised portions inwardly at the lower ends, while simultaneously ironing the raised portions to thin and elongate them.

3,769,697

METHOD AND APPARATUS FOR THE CONTINUOUS MANUFACTURE OF A FLEXIBLE WAVEGUIDE

Paolo Gazzana Priaroggia, Milan, and Antonio Portinari, Sesto San Giovanni, both of Italy, assignors to Industrie Pirelli Societe Per Azioni Centro Pirelli, Milan, Italy

Filed May 3, 1971, Ser. No. 139,633
Claims priority, application Italy, May 8, 1970, 24300 A/70
Int. Cl. H01p 11/00
U.S. Cl. 29—600 4 Claims



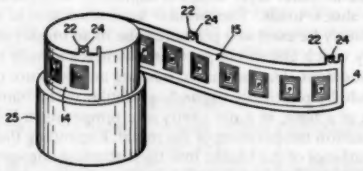
Method and apparatus for manufacturing long lengths of flexible waveguides which have an inner wall of a helically wound insulated conductor covered by insulating or metal tape over which a thermoplastic sheath is extruded, in which the insulated conductor is wound in a helix and advanced successively through tape winding and sheath extruding machines at a rate which permits each operation to be continuous. Subsequent to the extrusion of the sheath it is cooled and the waveguide is wound on a bobbin. Armoring and protective layers may be added to the waveguide prior to or subsequent to winding of the waveguide on the bobbin.

3,769,698

METHOD OF MANUFACTURING A PHOTOETCHED INDUCTION COIL

Ernest E. Lademann, Park Ridge, and James J. O'Connor, Old Bridge, both of N.J., assignors to The Bendix Corporation, Teterboro, N.J.

Division of Ser. No. 240,081, March 31, 1972, Pat. No. 3,736,543. This application Dec. 26, 1972, Ser. No. 317,999
Int. Cl. H01f 7/06
U.S. Cl. 29—602 6 Claims



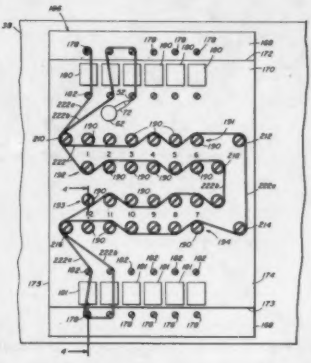
An induction coil assembly includes circuits photoetched on metallic laminates bonded to a flexible substrate. The substrate is wound on an arbor and pinned, after which it is removed from the arbor, impregnated and machined to provide an induction coil having close mechanical and electrical tolerances.

3,769,699

METHOD OF MAKING A MEMORY STORAGE DEVICE

Harold W. Bennett, Stoughton, and Barry E. Richards, Marlboro, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Division of Ser. No. 837,628, June 30, 1969, Pat. No. 3,619,884. This application Oct. 1, 1971, Ser. No. 185,645
Int. Cl. H01f 7/06
U.S. Cl. 29—604 2 Claims



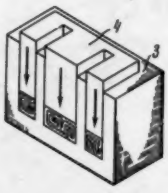
A wiring apparatus including a control console having means for receiving a programmed series of instructions and a wiring machine electrically controlled by the console and having means for moving a fixture below a reciprocally movable head carrying a tube through which a continuous wire is paid out onto the fixture, said fixture having means for guiding the wire through core positions and across terminal pads carried on the fixture.

3,769,700

METHOD FOR MANUFACTURING CORES OF ELECTRICAL DEVICES

Vasily Sergeevich Andrianov, Borisovskaya ulitsa, 21, kv. 11, Moscow, U.S.S.R.

Filed Oct. 19, 1971, Ser. No. 190,607
Int. Cl. H01f 7/06
U.S. Cl. 29—607 5 Claims



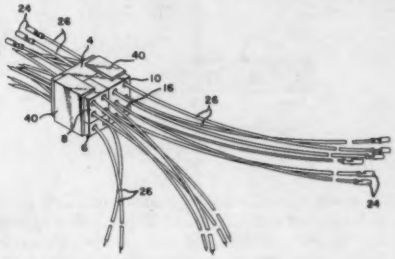
The method consists in deforming a sheet blank, in which slots have been made, along its transversal axis. Deforming forces are applied along the plane of the blank, perpendicular to the slots. These forces arbitrarily bend the blank and press it.

3,769,701

MANUFACTURING ELECTRICAL HARNESSES

James Albert Kloth, St. Petersburg, Fla., assignor to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 27,585, April 13, 1970, Pat. No. 3,667,101. This application Apr. 4, 1972, Ser. No. 240,959
Int. Cl. H01b 13/00
U.S. Cl. 29—624 2 Claims



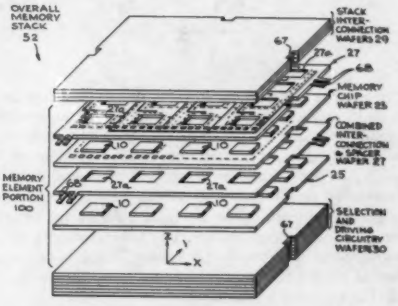
Electrical harness is manufactured by positioning connector housings in back-to-back relationship with their cavities in alignment, inserting wires through the aligned cavities, crimping terminals onto the ends of the wires, and moving the housings relatively along the wires until the terminals are lodged in the cavities. As an alternative embodiment, a removable guide means is used rather than the housing themselves.

3,769,702

3D-COAXIAL MEMORY CONSTRUCTION AND METHOD OF MAKING

Alfred D. Scarbrough, Northridge, Calif., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Division of Ser. No. 111,476, Feb. 1, 1971, Pat. No. 3,704,455. This application Aug. 9, 1972, Ser. No. 278,923
Int. Cl. H05k 3/28
U.S. Cl. 29—627 8 Claims


OVERALL MEMORY STACK 52
STACK INTER-CONNECTION WAFERS 29
MEMORY CHIP WAFER 23
COMBINED INTER-CONNECTION & SPACER WAFER 27
MEMORY ELEMENT PORTION 100
SELECTION AND DRIVING CIRCUITRY WAFER 30

A semiconductor memory in which integrated circuit chips each contain semiconductor flip-flop memory elements are mounted to respective ones of a plurality of batch-fabricated, pressure-stacked electrically conductive wafers so as to form a compact, essentially all metal, three-dimensional memory structure. Coaxially-shielded X, Y and Z conductors are formed in the conductive wafers by selective chemical etching for expeditiously providing the interconnections required for the integrated circuit chips in accordance with the desired memory organization.

3,769,703

METHOD OF SECURING END CONTACTS TO CABLES

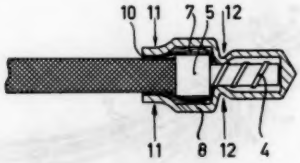
Louis Joseph Henri Geominy, Edisonstraat, Venlo, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 23, 1971, Ser. No. 173,903

Claims priority, application Netherlands, Aug. 31, 1970, 7012888

Int. Cl. H01r *43/00*

U.S. Cl. 29—628 **3 Claims**



A method of providing end contacts on cable pieces which can be subjected to tensile load without damaging the core. To this end the end contact is slid on a collar which is provided on the cable piece and is mechanically connected thereto by means of shrinking the overlapping part.

3,769,704

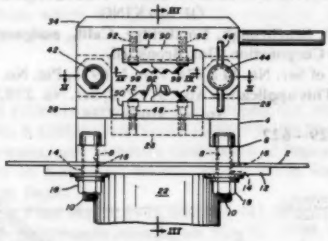
APPARATUS FOR JOINING MULTI-STRAND CABLES

Eugene V. Abarotin, Franklin Twp., Westmoreland, and Edward R. Bollinger, Jr., Delmont Borough, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Mar. 16, 1972, Ser. No. 235,181

Int. Cl. H01r *43/00*

U.S. Cl. 29—628 **4 Claims**



Connectors are secured to matching ends of conductors of two multi-conductor jacketed cables by simultaneously moving matching pairs of dies together. A pair of matching dies is provided for each set of matching ends of conductors. One die of each pair is mounted on a pressure plate and the other dies are mounted on a housing above the pressure plate. The pressure plate is moved upwardly by a fluid motor to crimp the connectors on the conductors. To enable a variety of sizes and constructions of cables to be spliced the dies are removably mounted on die retainers which are also removably attached to the housing and pressure plate.

3,769,705

WIRE STRIPPING DEVICE

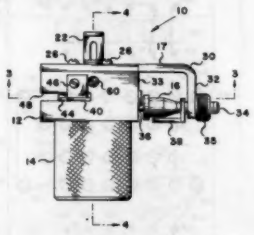
James A. Biddle, Sepulveda, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Dec. 20, 1971, Ser. No. 210,024

Int. Cl. B26b *27/00*

U.S. Cl. 30—90.1 **10 Claims**

A device for precisely and squarely cutting a length of insulation or shielding about a wire preparatory to stripping it from a cable, comprising a body member having a bore into which the cable is inserted and supported, a cutting element secured to a frame bearingly mated to the body member and which is adapted to communicate with such bore, means for biasing the frame and cutter in a direction for the cutter to engage the insulation about the wire, and a micrometer mounted in fixed spaced relationship to the body and which provides in its calibrated adjustment and operation for varying the exact degree or extent of movement or displacement for the frame and cutter as the cutter slices into the insulated cable. The setting of the micrometer limits the extent of movement of the frame and cutter in relation to the body member and its bore.



The biasing means is adjustable to effect the desired tension on the material of the insulation. Scale means is provided to determine the length of the cable to be inserted into the body and by which a length of insulation is determined to be cut. The cutter performs a slicing action across the insulation as the device is turned about the cable and in accordance with the tension provided by the adjustable biasing means, to effect a clean and true or square cutting of a layer of insulation or shielding to an exact depth. Adaptors or bushings are provided for the body for supporting a variety of sizes of insulated cables.

3,769,706

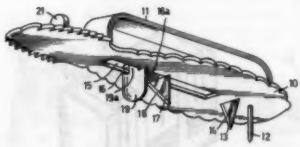
PINEAPPLE PEELER

Raymond George Ashdown, Kedron, Australia, assignor to Ashdown Inventions Pty., Ltd., Kedron, Brisbane, Queensland, Australia

Filed Oct. 12, 1972, Ser. No. 296,839

Int. Cl. A47j *25/00*

U.S. Cl. 30—113.3 **2 Claims**



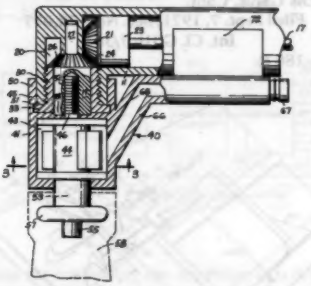
A pineapple peeler and corer has a base carrying a spike for inserting axially into the exposed end of the core of a pineapple with an end removed, a coring blade for insertion into the flesh adjacent to the core, and also an adjustably mounted peeling blade for insertion into the flesh adjacent to the peel and an associated guide for location adjacent to the outside of the peel to guide the peeling knife when the base is rotated about the spike by a handle to separate an annular section of the flesh from the core and peel.

3,769,707

PROPHY ATTACHMENT FOR DENTAL CONTRA-ANGLE

John J. Condon, N. 5901 Lidgerwood, Spokane, Wash.

Filed May 11, 1972, Ser. No. 252,220
Int. Cl. A61c 1/10
U.S. Cl. 32—27 6 Claims



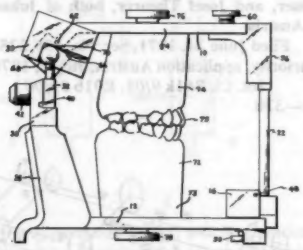
A prophy attachment is described for snapping onto a contra-angle for enabling the dentist to polish or abrasively clean a patient's teeth. The prophy attachment has a cavity formed therein for receiving prophy paste from a source. A prophy shaft extends through the cavity with one end connectable to the output shaft of the contra-angle and the other end for receiving a hollow prophy paste cup. A passageway extends through the attachment shaft with an opening in the cavity and another opening at the hollow prophy paste cup. Vanes are affixed to the attachment shaft for forcing prophy paste into the passageway and into the prophy cup as the shaft is rotated by the contra-angle.

3,769,708

AVERAGE ARTICULATOR

Niles F. Guichet, 3200 Olympia Pl., Anaheim, Calif.

Filed Sept. 27, 1971, Ser. No. 184,041
Int. Cl. A61c 11/00
U.S. Cl. 32—32 14 Claims



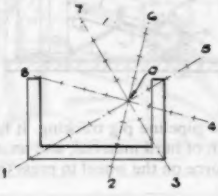
An articulator is described for movement of dental casts along pathways of average anatomical dimensions. The articulator is provided with a condyle-fossa hinged connection that has fixed or unadjustable medial and superior wall guides with posterior wall guides which are adjustable between two positions about a vertical axis through the condyle. In a preferred embodiment, replaceable inserts are used as superior and/or medial wall guides and several such inserts that duplicate fossa guide surfaces are provided. The articulator is for use in the instruction of students or for other applicatcns where the complex and delicate articulators which have multiple adjustments are not necessary. The articulator is preferably provided in combination with a series of dental casts which present typical dental problems as an instructional study aid.

3,769,709

INDEXING OF PLANE SHAPES

Eric C. Clarke, Wintersklоof, and Iain Hardy Lindsay, Pietermaritzburg, both of South Africa, assignors to Profile Identification (Proprietary) Limited, Pietermaritzburg-Province of Natal, South Africa

Filed Jan. 27, 1971, Ser. No. 110,148
Claims priority, application South Africa, Jan. 29, 1970, 70637
Int. Cl. G01b 3/00; G06k 9/00
U.S. Cl. 33—1 BB 6 Claims



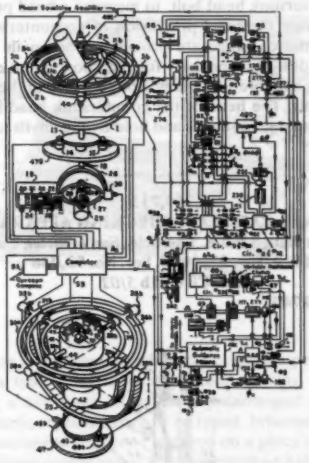
A method of measuring and indexing plane shapes or profiles, particularly the profiles of dies for extruded shapes or sections. The measurements are taken in a form and manner suitable for recording in a computer memory. Thereby identification and retrieval of dies previously made and having shapes and sizes comparable with each other, are facilitated. Thereby also unnecessary duplication of dies may be avoided. Final comparison of shapes is made by visual inspection. Also a device for measuring plane shapes or profiles in accordance with the method.

3,769,710

ELECTRONIC CELESTIAL NAVIGATION MEANS

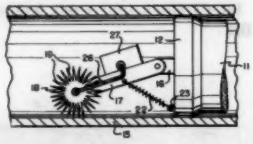
Richard A. Reister, Box 110-O.W.S. Rd., Yucca Valley, Calif.

Filed Apr. 1, 1969, Ser. No. 827,082
Int. Cl. G01c 21/00
U.S. Cl. 33—320 29 Claims



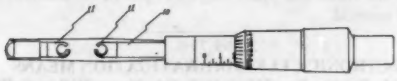
An automatic navigation and guidance system for use in moving vehicles such as air or sea craft, and more particularly a navigation system utilizing a single automatic star or satellite tracker through which a continuous indication of the longitude and latitude of the moving vehicle may be provided to an automatic guidance system, automatic star selection being provided, the described celestial navigation device providing continuous, accurate monitoring of a further inertial navigation device during normal operation, the further inertial navigation device providing continuous navigation and orientation during interruptions of the celestial navigation device.

3,769,711
ODOMETER
Norman E. Flournoy, and John P. Kersey, both of Ashland, Va., assignors to Texaco Inc., New York, N.Y.
Filed Sept. 24, 1971, Ser. No. 183,499
Int. Cl. G01b 3/12; G01m 3/28
U.S. Cl. 33—141 G 3 Claims



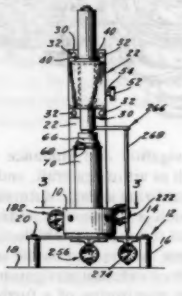
An odometer for pipeline pig tracking. It has a wheel with sharp pointed teeth of hard material, and an arrangement for applying enough force on the wheel to press the teeth into the pipeline walls.

3,769,712
THEORETICAL OUTSIDE DIAMETER ANVILS
Kyung J. Hong, 1140 S. Ardmore Ave., Los Angeles, Calif.
Filed Feb. 14, 1972, Ser. No. 225,885
Int. Cl. G01b 3/18
U.S. Cl. 33—164 R 1 Claim



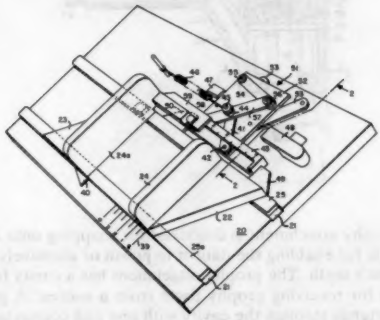
A set of special anvils for comparators of micrometer type or dial indicator type to measure a theoretical outside diameter of a countersunk head bolt, to measure a head protrusion, and to compare the head protrusion of a countersunk head bolt with a master gauge are provided. The anvils for comparators are designed specially for the above-mentioned purpose by using a theoretical triangle on the head of the countersunk head bolt. The head of the countersunk head bolt is inserted between a set of anvils and hold by the anvils to be measured.

3,769,713
EXTERNAL CAN SEAM CHECKING APPARATUS
Patrick S. Norman, 8259 E. Sheffield, San Gabriel, Calif.
Filed Nov. 27, 1970, Ser. No. 93,036
Int. Cl. G01b 5/02
U.S. Cl. 33—174 L 9 Claims



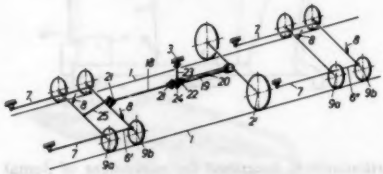
Apparatus for simultaneously measuring the seams and overall height of cans. The apparatus includes mechanisms for externally measuring the seam thickness, seam height, counter sink depth and the overall height of cans, simultaneously.

3,769,714
CENTERING MECHANISM
Earl R. Anderson, Los Gatos, Calif., assignor to Brex Corp., Trustee, Los Gatos, Calif.
Filed Sept. 7, 1971, Ser. No. 178,077
Int. Cl. G01b 3/30
U.S. Cl. 33—180 R 6 Claims



The centering mechanism and method described herein are used for locating objects with respect to a center line or to a center. The mechanism includes opposed centering members for engaging opposite sides of an article to be centered so as to grip the article as a part of an assembly including a gauging element which is differentially positioned in accordance with the measured dimension of the article. The assembly is then moved with the article in a given direction to engage the gauging element with a stop at which time any article within a given range of sizes will be located in position with its center on a center line previously determined or with its center at a center point which has been previously determined.

3,769,715
MOBILE TRACK SURVEY APPARATUS FOR DETERMINING THE TRACK CAMBER
Franz Plasser, and Josef Theurer, both of Johannesgasse 3, Vienna, Austria
Filed June 24, 1971, Ser. No. 156,225
Claims priority, application Austria, July 2, 1970, 5962
Int. Cl. B61k 9/08; E01b 29/00
U.S. Cl. 33—338 4 Claims



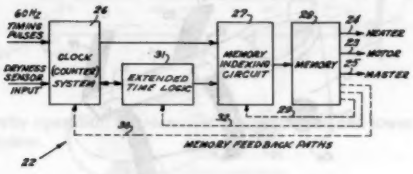
Two sensing elements each engaged with both rails and spaced apart in the track elongation direction survey the vertical positions of the rails at four points defining a rectangle. An elastically deformable rod interconnects the sensing elements so that a difference in the vertical positions of the rails deforms the rod in response to a vertical movement of a sensing element. The deformation of the rod causes a strain to be set up in the rod and a resistance strain gage on the rod measures this strain and generates an electrical measuring signal proportional to the movement of the sensing element. An electrical measuring signal indicator is connected to the strain gage to indicate the signal.

3,769,716

VARIABLE TIMER RUNOUT CONTROL FOR DRYER

Donald E. Janke, Benton Harbor; Roque D. Marcade, Stevensville, and Joseph Karklys, St. Joseph, all of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Nov. 12, 1971, Ser. No. 198,354
Int. Cl. F26b *3/04*; G05f *5/00*
U.S. Cl. 34—33 9 Claims



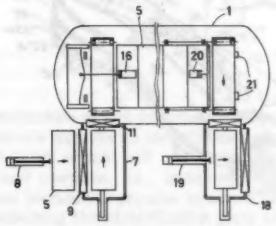
Apparatus for controlling the operation of a dryer includes a circuit to sense for a predetermined dryness condition during a drying operation, a circuit for determining the elapsed time interval in attaining that condition and means for extending the drying operation by an interval determined in accordance with the elapsed sensed drying time to improve repeatability in percent moisture retention particularly with respect to loads which are difficult to dry.

3,769,717

APPARATUS FOR FREEZEDRYING MATERIAL WITH LOADING AND DISCHARCING MEANS

Jorgen Lorentzen, Alf. Christensensvej 10, Naerum; Verner Christiansen, Kongebakken 48, Roskilde, and Carl Carlsen, Tvaervej 71, Virum, all of Denmark

Filed Aug. 24, 1971, Ser. No. 174,448
Claims priority, application Denmark, Aug. 25, 1970, 4341
Int. Cl. F26b *5/06*
U.S. Cl. 34—92 14 Claims



Freeze drying apparatus is shown which comprises a freeze drying chamber with a charging lock at one end through which materials to be freeze dried are introduced to the chamber. At the other end of the chamber a discharge lock is provided. Elevator means are provided in the lock and conveying means are provided for conducting materials through the freeze drying chamber from a charging lock to the discharge lock.

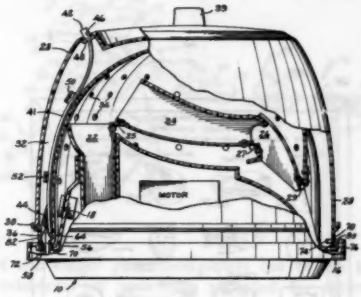
3,769,718

HAIR DRYER WITH RELEASE MECHANISM

Esko J. Nopanen, Asheboro, N.C., assignor to General Electric Company, Bridgeport, Conn.

Filed Sept. 15, 1972, Ser. No. 289,662
Int. Cl. A45d *20/00*; E05c *13/04*
U.S. Cl. 34—99 8 Claims

A hair dryer that may be collapsed for carrying and storage and erected for operation, including a base assembly, a rigid hood assembly to be positioned about the head of the user for distributing heated air to the head, and a strut for supporting the rigid hood assembly elevated from the base assembly. A latch release mechanism is provided that releases the hood assembly from the base assembly to allow the hood assembly to be raised simultaneously to its operational position, all with one hand.

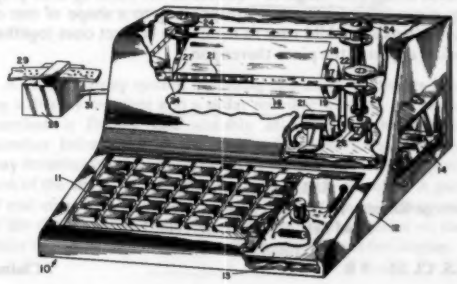


3,769,719

TEACHING SYSTEM FOR KEYBOARD DEVICES

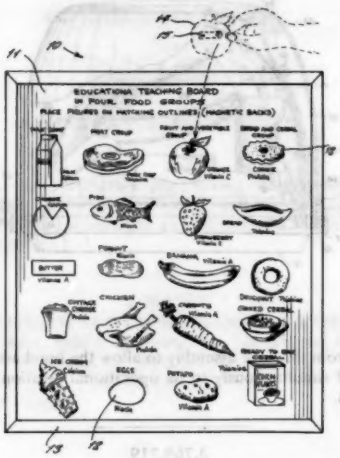
Jack B. Meister, Convent Station, N.J., assignor to Integrated Electronics Corp., Dover, N.J.

Filed Jan. 10, 1972, Ser. No. 216,581
Int. Cl. G09b *3/00*
U.S. Cl. 35—6 3 Claims



A system is disclosed in which a keyboard operated device such as a typewriter is simulated for training purposes by providing a keyboard on which a prearranged sequence of alphanumeric characters are to be typed. Information relating to the prearranged sequence is stored on a piece of paper tape in a paper tape reader and is also presented on a sheet of paper inserted in the device. A covering means having a window therein is employed to cover the typed material. As the correct sequence is typed on the keyboard, the window advances incrementally one space at a time after a comparison is made between the information stored on the paper tape and the typed character. If a match is not made therebetween, the keyboard is inhibited so that the student cannot proceed further. When the window reaches the end of the line, the covering means is reset to recover the typed line and the paper upon which the alphanumeric information is present is advanced so that the line previously incrementally uncovered is moved out of the field of the covering means.

3,769,720
EDUCATIONAL TEACHING BOARD IN FOUR FOOD GROUPS
Consuelo Terrones, 501 Mission Road, El Paso, Tex.
Filed June 1, 1972, Ser. No. 258,771
Int. Cl. G09b *1/08*
U.S. Cl. 35—7 A **1 Claim**

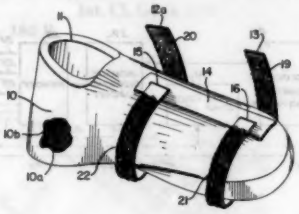


An educational device for teaching food nutrition to children, while at the same time providing diversion and play so to hold their attention, the device consisting of a game board upon which different food groups are represented by pictorial designs, the game board surface being of sheet so that playing pieces fitted with magnets will hold to the surface, each playing piece having a shape corresponding to a shape of one of the designs so a child tries to match the correct ones together before applying the piece thereupon.

3,769,721
EDUCATIONAL DEVICE
George Reiner, 16 E. 52nd Street, New York, N.Y.
Filed Feb. 14, 1972, Ser. No. 225,780
Int. Cl. G09b *1/10*
U.S. Cl. 35—9 R **7 Claims**

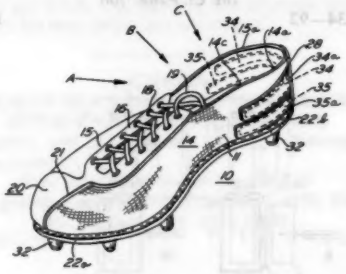
An educational device in which a problem is presented to a child and in which the device is set to be keyed to the correct answer in such a manner that answer carrying members can be mounted in the device only when the correct answer is selected by the child. The answers are embodied in one or more individual card-like components and the device is preset so that the device will accept only the correct card-like components in response to any particular problem.

3,769,722
PROTECTIVE SHOE
Jhoon Goo Rhee, 2525 N. Ridgeview Rd., Arlington, Va.
Filed May 10, 1972, Ser. No. 252,089
Int. Cl. A41d *17/00*
U.S. Cl. 36—2 R **7 Claims**



The invention relates to a protective shoe adapted to protect the foot of the wearer thereof practicing the arts of karate, etc. The shoe comprises a casing of soft resilient material open at the bottom, and is provided with straps for retaining the shoe on the foot.

3,769,723
ATHLETIC FOOTWEAR
William Charles Masterson, deceased, late of 509 W. Lake Ave., Bay Head, N.J. (by Mary Masterson, executrix), and Michael E. Wilbert, 183 Maple Dr., Bay Head, N.J.
Filed Dec. 14, 1972, Ser. No. 314,962
Int. Cl. A43b *11/00*
U.S. Cl. 36—2.5 R **6 Claims**

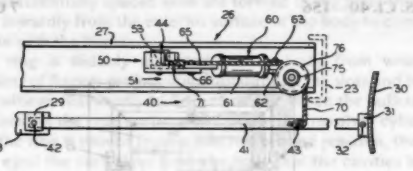


A shoe for athletics comprising an upper, a sole portion, a heel portion and cleats secured to the sole and heel portions. The upper comprises an inner side made of an elastic material and an outer side made of a substantially inextensible material. Both inner and outer sides are secured to the sole and heel portions and provide a shoe which snugly fits the player. When the player is hit by a substantial impact force the inner side expands, absorbing energy from the force and allowing the foot to move laterally out of the shoe over the sole and heel portion to reduce injury.

3,769,724
PLOW BLADE HOIST WITH UNDER-TRUCK MOUNT
Ronald Jack Norgaard, 2542 Spruce St., River Grove, Ill.
Filed Dec. 8, 1969, Ser. No. 882,915
Int. Cl. E01h *5/00*
U.S. Cl. 37—41 **1 Claim**

A hoist assembly includes an arm disposed beneath a truck and protruding therefrom, a snowplow or other work member being mounted on the outer end of the arm, the other end of

the arm being pivotally mounted to the underside of the truck, a motor, such as a hydraulic piston, mounted on the underside of the truck and connected to the arm by means of a link,

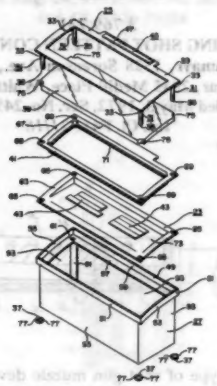


whereby operation of the motor serves to raise and lower the snowplow.

3,769,725
IDENTIFICATION PLATE

Arthur Stewart, Jr., 780 Inez, Memphis, Tenn.

Filed Apr. 28, 1972, Ser. No. 248,627
Int. Cl. G09f *3/18*
U.S. Cl. 40—10 R **5 Claims**



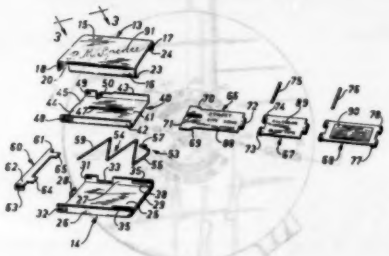
An identification device for attachment to a door of a vehicle. The device includes an identification plate having certain indicia thereon which will aid in readily identifying an unauthorized operator, i.e., indicating that the vehicle is stolen. Also included is peculiar structure requiring a special tool for attaching the identification plate to the vehicle and structure for obscuring the peculiar attaching structure thus rendering the identification plate substantially tamperproof.

3,769,726
EXPANSIBLE MECHANISM

Peter Marvin Spence, 2360 Bonner Rd., Clarkson, Ontario, Canada

Filed Apr. 5, 1971, Ser. No. 130,927
Int. Cl. G09f *3/14*
U.S. Cl. 40—21 C **18 Claims**

An expansible mechanism suitable for use as an expanding fastening device for a wrist watch strap or band and for recording personal identification information is described. The information-bearing panels of the mechanism are serially interconnected through end hinges so that they can be folded over into a concertina-like configuration for retraction into a housing. A displaceable detent tongue within the housing normally engages a lug on a longer one of the panels to retain all the panels in their retracted positions within the housing. A release stud on the housing is effective to displace the detent tongue to allow the panels to be automatically extended through an open end of the housing under the action of a compression spring within the housing, shoulders being provided at the open end of the housing to prevent the bodily move-

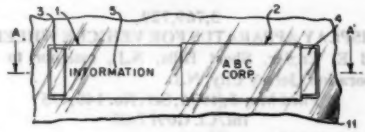


ment of the longer panel completely out of the housing. Holder-adaptors are optionally provided for alternatively fastening the mechanism to a key ring or for clipping it in a person's pocket.

3,769,727
INFORMATION DISPLAY SYSTEM

Marc T. Kent, Jr., 820 Soundview Dr., Mamaroneck, N.Y.

Filed Feb. 7, 1972, Ser. No. 224,136
Int. Cl. G09f *11/00*
U.S. Cl. 40—62 **1 Claim**



A visual display system including two major members having a display member and a slider member whereby the slider member is fixedly and slidably attached to the display member. Information on the front and rear surfaces of the display member is selectively shown in accordance with the position of the slider member on the main display member. A pair of end stops are provided to control the maximum movement of the slider on the display member. Optional adhesive on the slider can serve as a means for affixing the system for display.

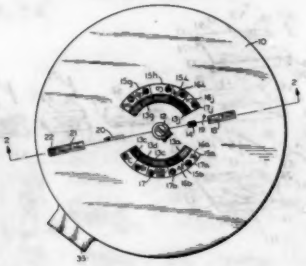
3,769,728
DIAL DEVICE FOR DETERMINING RELATIONSHIPS SUCH AS CHEMICAL REACTIONS

Yung-Cheh Lu, G.P.O. Box K-1902 Central Post Office, Kowloon, Hong Kong

Filed Jan. 3, 1972, Ser. No. 214,630
Int. Cl. G09f *11/04*
U.S. Cl. 40—70 R **10 Claims**

A dial device which has upper and lower dials pivoted to each other and having two pairs of windows in the upper dial, one for exposing colors from arc portions on the lower dials and the other for exposing bits of information, such as chemical reactants, and relationships of bits of information, such as chemical products, respectively. The upper dial has thereon colored portions and related color indicators of a different color which together indicate a further bit of information, such as a further chemical reactant or chemical reaction process, such as heating. The colors and color indicators on the upper dial are related to the colors appearing through the color exposing windows so that the relationship, such as the

chemical reaction, appearing in the second of the windows in the upper dial is the relationship, such as the reaction, between the bit of information in the first window and the bit

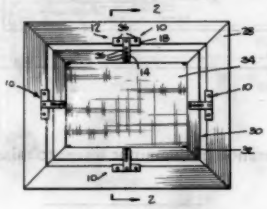


of information represented by the corresponding color indicator and colored portion on the upper dial.

3,769,729
DISPLAY APPARATUS FOR VEHICLE WHEELS
Clifford E. Engler, Short Hills, N.J., assignor to Gilurin Corporation, Jersey City, N.J.
Filed May 5, 1971, Ser. No. 140,475
Int. Cl. G09f *7/00*
U.S. Cl. 40—129 B **1 Claim**

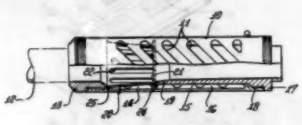
A display apparatus includes a main plate of a diameter such that its peripheral edge portion is abuttingly secured to a vehicle wheel rim and on which is rotatably mounted a display disk held by a counterweight against rotation where the wheel is rotating, and a transparent cover for the disk whose edge flange is separably secured to the peripheral edge portion of the main plate.

3,769,730
PAINTING FASTENER
John S. Dole, 124 Ritch Avenue, Byram, Conn.
Filed July 15, 1971, Ser. No. 162,764
Int. Cl. G09f *1/12*
U.S. Cl. 40—156 **7 Claims**



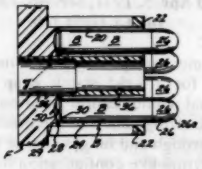
A fastener in which a substantially flexible member is affixed to a substantially rigid member so as to protrude therefrom for securing releasably an inner member within an outer frame.

3,769,731
ANTI-FOULING SHOT PATTERN CONTROL DEVICE
Frank A. Pachmayr, 7526 Sorenson Ave., Los Angeles, and Jack R. Farrar, 2845 Medill Place, Whittier, both of Calif.
Filed May 3, 1972, Ser. No. 249,823
Int. Cl. F41c *21/18*
U.S. Cl. 42—79 **3 Claims**



In a known type of shot gun muzzle device comprising an outer apertured cage mounted by an adapter to the gun muzzle and containing a shot-passing tube spaced from the muzzle and adapter to provide a gas release gap, the invention provides an apertured interceptor serving to prevent or minimize entry of shell wad debris into the outer cage apertures.

3,769,732
REVOLVER RELOADING DEVICE
William T. Griffis, 201 Cypress Dr., Apt. 2, Laguna Beach, Calif.
Filed July 28, 1972, Ser. No. 276,067
Int. Cl. F42b *39/04*
U.S. Cl. 42—89 **10 Claims**



A two-piece device that is preferably molded from a polymerized resin for use in rapidly reloading a revolver with cartridges, and which is so low in cost that it may be discarded

after the reloading operation is completed. The device includes a body in which a number of parallel, circumferentially spaced bores are formed in which cartridges are stored, with the bullets projecting outwardly from the body. A number of circumferentially spaced slots are formed in the body that extend inwardly from the exterior surface of the body to communicate with the bores.

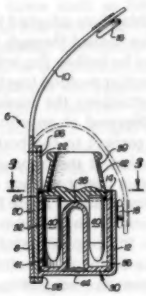
A ring is slidably mounted on the body from which a number of fingers project inwardly through the slots and bores to positions rearwardly of the cartridges. When the bullets are disposed in the rear portions of cavities in a revolver cylinder, and the ring is moved from a first to a second position, the fingers eject the cartridges from the body into the cavities to reload the revolver.

3,769,733

AMMUNITION LOADER FOR REVOLVERS

Norman C. Nelson, Chino, Calif., assignor to Kel-lite Industries, Inc., Covina, Calif.

Filed Aug. 24, 1972, Ser. No. 283,363
Int. Cl. F42b *39/04*
U.S. Cl. 42—89 **6 Claims**



A revolver loading kit including a clip for holding a plurality of cartridges by their bases and a receiver for the cartridge clip conveniently worn on the user's belt, and including means for holding the cartridges in predetermined positional relationship whereby the clip and cartridges can be removed from the receiver and the cartridges simultaneously introduced into the cylinder of a revolver precisely and quickly, the receiver having a readily releasable retainer for holding the clip in position.

3,769,734

FISHING EQUIPMENT RETRIEVER

John A. Winkler, Oil City, Pa., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed July 24, 1972, Ser. No. 274,589
Int. Cl. A01k *97/00*
U.S. Cl. 43—17.2 **4 Claims**

A first hollow cylindrical sleeve open at both ends and having an elongated slot extending in the axial direction between the ends is rotatably disposed in a second like but somewhat larger sleeve having a parallel slot. Spaced prongs are secured to one end of the first sleeve and extend outward. A separate

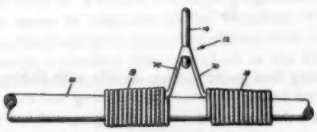
chain is associated with each prong and is secured at one end thereto.

3,769,735

LINE GUIDE ATTACHMENT FOR FISHING RODS

Barry D. Cousin, assignor to Plas/Steel Products, Inc., Walkerton, Ind.

Division of Ser. No. 30,133, April 20, 1970. This application Aug. 2, 1971, Ser. No. 168,334
Int. Cl. A01k *87/04*
U.S. Cl. 43—24 **5 Claims**



A line guide having two collinearly extending legs flush with the surface of a fishing rod securely affixed thereto by means of preformed helical wire coils surrounding both the legs and the rod. The method and apparatus for attaching the line guide to the rod includes a pair of relatively movable fixtures having die cavities adapted to receive an assembly of helical wire coils and a line guide in such position that the legs of the line guide are fitted into the coils. The fixtures are provided with collinear die bores through which may be inserted in succession a tapered rod, the die bores being in registry with the wire coils such that the rod can pass therethrough. The rod is forced into tight engagement with the coils relative movement between the fixtures facilitating engagement first with the coils in the recess of one fixture and secondly with the coils in the recess of the other fixture.

3,769,736

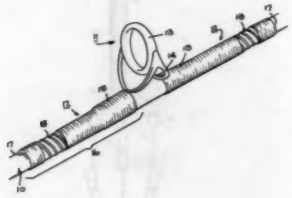
HEAT SEALED THREAD WINDING AS FOR FISHING RODS

Frank Nydam, Columbia, S.C., assignor to Columbia Products Company, Columbia, S.C.

Filed July 20, 1972, Ser. No. 273,539
Int. Cl. A01k *87/04*
U.S. Cl. 43—24 **19 Claims**

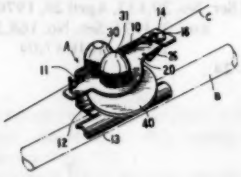
A fishing line guide is secured to a rod by a thread winding wound from a starting end which is tucked under a line guide to a tail end which is secured by heat fusion to an adjacent

turn of the thread winding. The thread winding forms a single thread layer. In order to fuse the tail end to an adjacent turn of the thread winding, the thread is wound about the guide and rod and, with the unwound portion of the thread held taut, a



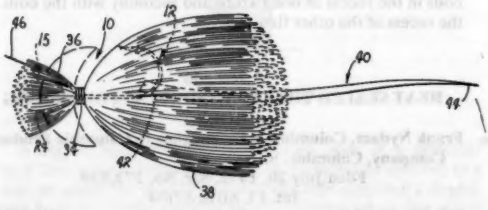
heated rod is swept across the point where the thread leaves the rod to melt and sever the thread thereat while fusing the resultant tail end to the adjacent turn of the thread winding.

3,769,737
FISHING LINE GUIDE DEVICE
Toshiaki Miyamae, 292, Nishi-Iwata, Higashi-Osaka, Japan
Filed July 5, 1972, Ser. No. 269,028
Claims priority, application Japan, Oct. 30, 1971, 46/86653
Int. Cl. A01k *87/00*
U.S. Cl. 43—25 **9 Claims**



In a fishing line guide device usable with fishing reels of a type adapted to be mounted on a fishing rod at a right angle with the axis thereof, said device being operable by use of the running motion of a fishing line that is being retrieved to the reel, thereby uniformly rewinding the line to the reel. The device is further provided with a means for controlling the interval at which the fishing line is to be rewound on the reel through the full length thereof.

3,769,738
FISHING LURE
Daniel P. Begley, 510 Willow St., Fresno, Calif.
Division of Ser. No. 839,030, July 3, 1969, Pat. No. 3,590,514.
This application July 6, 1971, Ser. No. 160,124
Int. Cl. A01k *85/00*
U.S. Cl. 43—42.26 **6 Claims**



This disclosure relates to a fishing lure. The fishing lure has a weighted head adjacent the eye end of a fishhook with the eye protruding from the head. A tie wire is located in the head and is utilized to wrap a sheet of shredable rubber intermediate its ends about the shank of the hook adjacent the head. The tie wire is operatively associated with, and may also be interconnected with, the fishhook. The rubber is shredded at its ends to form a shredded hook skirt which covers and extends beyond the barb end of the hook and a neck skirt which projects outward from the point of wrap adjacent the molded head. The shreds have sufficient length and flexibility to reverse directions, so that those forming the neck skirt bend rearwardly toward the barb end of the fishhook as the lure is drawn through the water. A flexible tail may be added by impaling its lead end with the barb of the hook.

3,769,739
FISHING LURE
John O. Pitts, 268 W. Parkview, Grand Junction, Colo.
Filed Aug. 21, 1972, Ser. No. 282,116
Int. Cl. A01k *85/00*
U.S. Cl. 43—42.35 **5 Claims**

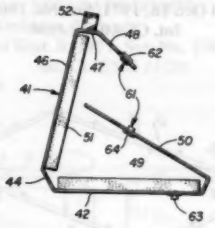
An improved fishing lure adapted to gyrate in a manner attractive to fish when moved through the water has a cylindrical body which may be hollow for holding fish scent. One end of the body is pressed or molded together to form a planar surfaced section for attaching the leader and line thereto. The leader section is disposed at an obtuse angle of from about 135° to 175° with respect to the body member. An elongate tail section is disposed at the opposite end of the cylindrical body and has an open upper surface and a generally concave cross section with flared sides. These flared sides have increasing lateral dimension from the point of attachment at the cylindrical body to the opposite end of the tail section. The open upper surface of the tail section can be disposed in a rotated position about the longitudinal axis of the body, such that the angle of rotation measures from about 5° to about 32° maximum.

3,769,740
CHUM DISPENSING DEVICE
Albert F. Lang, 20 Emerson Ter., Bloomfield, N.J.
Filed May 10, 1972, Ser. No. 251,943
Int. Cl. A01k *97/02*
U.S. Cl. 43—44.99 **14 Claims**

A chum dispensing device comprising a buoyant chum holder and dispenser on a leader line which optionally has a connector on its free end. A preferred chum dispensing device

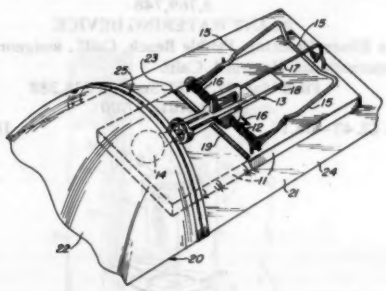
comprises the buoyant chum dispensing device in combination with a carrier sinker therefor.

3,769,741
FISHING EQUIPMENT CARRIER
Albert Hessler, 3359 Pecos St., and Lyston E. Bucklin, 3182 S. Gilpin, both of Denver, Colo.
Filed Oct. 5, 1971, Ser. No. 186,744
Int. Cl. A01k *97/06*
U.S. Cl. 43—57.5 R **4 Claims**



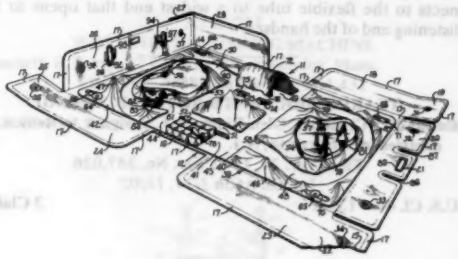
A fishing equipment support for convenient usage in storing, carrying and using items such as fish lures, bait, flies, hooks, etc. Lures are held and protected by pads of soft foam mounted on cover pieces that alternately fold to enclose or open to display the lures. A multi-element fastener system is provided that reverses to hold the support in closed or user configurations. Lightweight materials provide a flotation capability. The support includes a hinged divider element for interpositioning between the pads to prevent interference between lures disposed on the pads.

3,769,742
MOUSE TRAP
Theodore H. Spain, 885 Prairie Ave., Des Plaines; Allen F. J. Geimer, 1701 Richard W. Dr., Glenview, and Victor E. Loesche, Jr., 3402 Elaine Ave., Park City, all of Ill.
Filed June 2, 1972, Ser. No. 259,138
Int. Cl. A01m *23/00*
U.S. Cl. 43—81 **3 Claims**



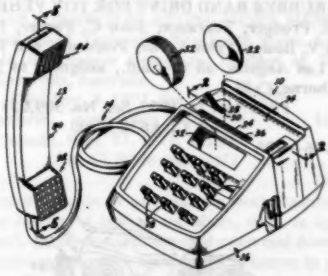
A mouse trap is provided with a finger operable release lever for lifting the striking bar from a dead mouse that has been caught in a trap, so that a person emptying the trap does not touch the mouse, and with a plastic bag to receive the dead mouse. The plastic bag is positioned to protect the trap against contamination when a mouse is killed by the striking bar. A second plastic bag may be mounted on the striking bar to prevent contamination of the bar.

3,769,743
VIBRATORY TOY
Erwin Benkoe, Manhasset Hills, and Julius Cooper, New Hyde Park, both of N.Y., assignors to Ideal Toy Corporation, Hollis, N.Y.
Filed Aug. 19, 1971, Ser. No. 173,181
Int. Cl. A63h *33/00*
U.S. Cl. 46—1 C **14 Claims**



A toy comprising a support structure of panels joined together by hinge sections to be laid out flat or folded and fastened together to form an enclosure. Attached to the support structure and on the interior surface thereof when the support structure is folded to form an enclosure is a separate operative member having sufficient freedom to permit vibratory motion relative to the support structure. A vibrator supported on the support structure comprises a power input device, such as a rotatable crank handle; a power transmission section, such as a step-up gearbox; and an output device, such as an eccentric shaft, connected to the operative member to vibrate the latter with rapid translatory motion when the handle is turned. The operative member has bounded areas, such as an open area or a closed track, and figurines are placed thereon to move in response to the vibration. Figurines to move along the track have support platforms with downwardly and rearwardly extending fibers of plush or the like to move the figurines in one direction along the track.

3,769,744
TELEPHONE TOY WITH PHONOGRAPH
Thomas E. Sloane, Jr., Rolling Hills Estates; William Hart, and William B. Pester, both of Palos Verdes Peninsula, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed Aug. 4, 1972, Ser. No. 278,133
Int. Cl. A63h *33/30*
U.S. Cl. 46—33 **8 Claims**



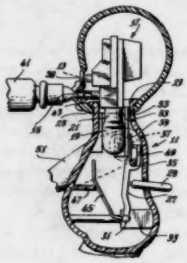
A toy telephone which utilizes a self-contained phonograph module that is securely held in a position that permits easy operation and which efficiently couples the output of the module to the handset of the telephone. The telephone housing has a record-receiving slot aligned with the phonograph

module slot, and has a supporting wall opposite the slot with a raised strap-like portion that resiliently biases the module against the slotted wall of the telephone housing. A sound collector is mounted on the module housing over the speaker cone thereof, the sound collector having a flat wall facing the speaker cone and a flange extending around the periphery of the speaker cone and forming a tapered region at one side where the collector connects to a flexible tube that leads to the handset. The handset has an elongated tubular member that tapers in cross section from a narrowest end which connects to the flexible tube to a widest end that opens to the listening end of the handset.

3,769,745
TEARING DOLL WITH ROTATABLE HEAD

Dorland L. Crosman, Glen Ridge, N.J., assignor to Remco Industries Inc., Harrison, N.J.

Filed Apr. 24, 1972, Ser. No. 247,026
Int. Cl. A63h *3/24, 13/02*
U.S. Cl. 46—135 A **3 Claims**

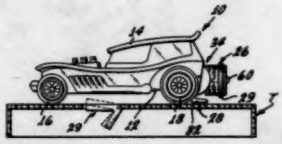


An improved toy doll which will produce tearing and simultaneously move its arms (in response thereto) to provide the appearance of a crying doll. A fluid reservoir, located in the head of the doll includes ducting to carry the fluid from that reservoir to the eyes of the doll. The eyes of the doll are arranged with respect to the ducting so as to deflect the fluid passing therethrough to create the appearance of a crying or tearing doll. An elastically compressible bulb, connected to the fluid reservoir, is located in the passageway between the head and the body of the doll and is aligned along the axis of rotation of the head. When the bulb is compressed, the fluid contained therein is displaced and passes from the fluid reservoir to the eyes of the doll. The tearing system has no overflow or air intake ports inside the doll.

3,769,746
RUBBER BAND DRIVE FOR TOY VEHICLE

Brian S. Prodger, Torrance; John C. Parker, Los Angeles; Denis V. Bosley, Palos Verdes Peninsula, and Raymond M. Toy, Los Angeles, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Nov. 24, 1972, Ser. No. 309,031
Int. Cl. A63h *17/00*
U.S. Cl. 46—206 **11 Claims**

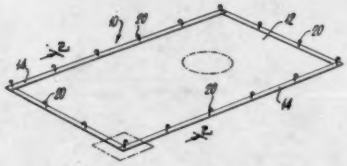


A toy vehicle with a large knob at the rear and a rubber band motor that is wound by rolling the knob back and forth on the ground. The vehicle may then be released and run under the influence of the rubber band. Alternatively, the knob may be pulled back to prevent immediate unwinding of the motor. The vehicle may then be started by tipping it back to a "wheelie" position so that a release member behind the rear wheels is pressed up to release the rubber band motor or the vehicle may be pushed by hand or otherwise propelled until it is desired to press the release member and release the rubber band motor.

3,769,747
COVERING FOR A SEED OR PLANT BED

George Chapman, Jr., Ridgewood, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Oct. 18, 1971, Ser. No. 190,016
Int. Cl. A01g *13/04*
U.S. Cl. 47—31 **11 Claims**

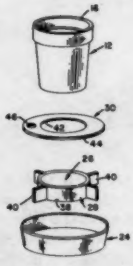


A light weight, substantially rectangular covering for a seed or plant bed comprising: a flat, substantially planar body portion formed of a nonwoven reticulated filamentary structure of overlapping, intersecting continuous synthetic organic thermoplastic filaments bonded to each other at a multiplicity of irregularly spaced points along their lengths, the continuous filaments being disposed in random, intermingled configurations uniformly distributed throughout the structure without a pattern of parallelism between the continous filaments so that no two parts of the structure are identical reinforcing edge portions on both sides and both ends of the seed or plant bed covering; reinforcing strips of synthetic organic thermoplastic material positioned within the reinforcing edge portions of the nonwoven reticulated filamentary structure; and a plurality of openings formed at spaced intervals in the reinforcing edge portions and the reinforcing strips for use with fastening devices whereby the covering may be secured in place over the seed or plant bed during use.

3,769,748
PLANT WATERING DEVICE

John Elmer Goldring, Pebble Beach, Calif., assignor to Argo International, Hayward, Calif.

Filed Mar. 27, 1972, Ser. No. 238,388
Int. Cl. A01g *27/00*
U.S. Cl. 47—38.1 **10 Claims**



A plant watering device for potted plants in which the pot is provided with one or more holes in its bottom wall. The device

includes a reservoir for containing a supply of water and a phenolic foam pad disposed generally centrally of the reservoir with the upper surface of the pad positioned above the level of water in the reservoir and adapted to support the bottom wall of the pot.

The pad may be provided with plant nutrients, preferably in the nature of slow time release pellets.

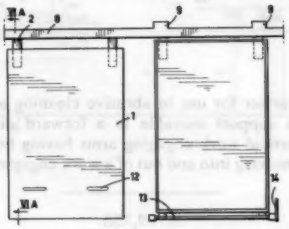
In another embodiment, small phenolic foam plugs are provided to be inserted in a hole or holes in the bottom of the pot to insure water transfer between the pad and the soil or other grown medium in the pot.

3,769,749

SLIDING DOOR CONSISTING OF ONE OF SEVERAL SEPARATE DOORS

Leo Makela, Vesivehmaa, Finland

Filed Sept. 8, 1971, Ser. No. 178,593
Int. Cl. E05d *15/20*
U.S. Cl. 49—130 **4 Claims**



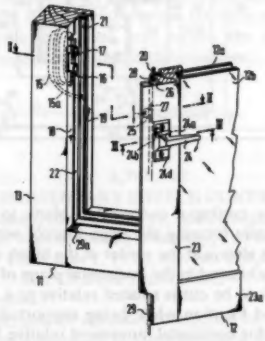
A sliding door comprising several doors supported at their upper edges in slideways which have upward and inward directed guides for pegs of the door supports so that a respective door may be lifted and laterally displaced to permit another door to be moved along the same slideway passed the displaced door.

3,769,750

DOOR OR WINDOW WITH FLUID-OPERATED SEAL

Siegfried Mayer, Wolbeck; Bernhard Janke, and Werner Frach, both of Bayreuth, all of Germany, assignors to Aug. Winkhaus, Telgte/Westfalen, Germany

Filed Nov. 10, 1972, Ser. No. 305,350
Int. Cl. E06b *7/16*
U.S. Cl. 49—477 **10 Claims**



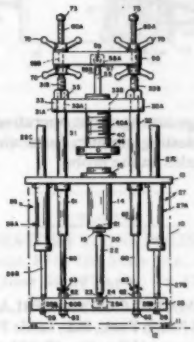
A door or window arrangement whose frame encloses a pump. The door or window panel is equipped with a movable handle for manually opening and closing the opening in the frame by means of the panel. In the closed position of the panel, a pliable tube communicating with the pump is located between the panel and the frame, seals the frame opening, and locks the panel in place when the handle is moved on the panel. Coupling elements on the frame and panel are engaged in the closed position, the movement of the handle is transmitted to the coupling, and from the coupling to the pump which inflates the tube.

3,769,751

WORKPIECE FINISHING MACHINE

Kenneth E. Perry, 27 Lathrop Rd., Wellesley, Mass.

Filed June 20, 1972, Ser. No. 264,431
Int. Cl. B24b *27/00, 19/00*
U.S. Cl. 51—2 R **12 Claims**



A machine including first and second cylinders, a piston supported in each cylinder and constructed to move back and forth therein to force a flowable abrasive composition back and forth from one cylinder to the other through a workpiece supported by a tool between the two cylinders, the first of the cylinders being provided with threads about the outside thereof and being supported in a threaded bore in a support means, and said first cylinder being provided with means to rotate it with respect to its support and the second cylinder to clamp the tool supporting the workpiece with respect to the cylinders.

3,769,752

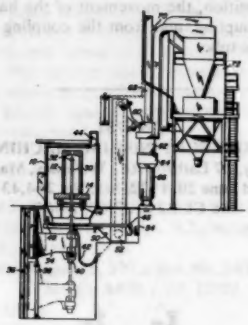
APPARATUS FOR SHOT BLASTING WORK MEMBERS

Alexander McDonald, Tamworth, New South Wales, Australia, assignor to Blastmaster Company, Division of Tekology Limited, Granville, Australia

Filed Nov. 4, 1971, Ser. No. 195,593
Claims priority, application Australia, Nov. 11, 1970, P.A. 3158; Canada, Sept. 17, 1971, 123,087
Int. Cl. B24c *3/04, 3/32*
U.S. Cl. 51—5 **18 Claims**

An apparatus for shot or grit blasting work members, particularly the insides of hollow members, such as cylinders, when the work members are supported open end downwardly and move into and out of a treatment enclosure in which is disposed a vertically moveable rod like probe having nozzles thereon supplied with air and blasting medium, such as shot. The installation includes a blower arrangement for exhausting dust from the treatment enclosure, and a further arrangement for conveying therefrom sand and spent blasting medium, while separating the sand from the blasting medium and, further, separating trash from the blasting medium and then

conveying the separated fractions to respective points of delivery with the point of delivery of the blasting medium



comprising a storage arrangement operatively connected with a hopper for the blasting medium from which the medium is supplied to the nozzles on the probe.

3,769,753

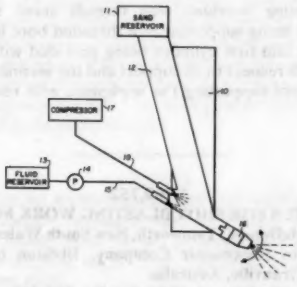
AUTOMATIC CAR SAND BLASTER

Henry Fleischer, 18 Notch Park, Rd., Little Falls, N.J.

Continuation-in-part of Ser. No. 68,151, Aug. 31, 1970, abandoned. This application Mar. 16, 1972, Ser. No. 235,293

Int. Cl. B24c 3/12

U.S. Cl. 51—11 **7 Claims**



An apparatus is disclosed in which a mixture of a highly volatile chemical solvent and an abrasive is sprayed onto the surface of an automobile at an obilique angle. The abrasive removes the paint without chipping and roughs up the surface while the chemical solvent removes film and dirt thereby enabling the surface of the automobile to receive a new coat of paint.

One embodiment of the apparatus is disclosed in which spraying devices are mounted around a platform upon which an automobile may rest. The platform has a drain for carrying away solvent and abrasive after it runs off the body of the car. Conveyors are employed to recycle the still useable materials to reservoirs from which they initially came.

3,769,754

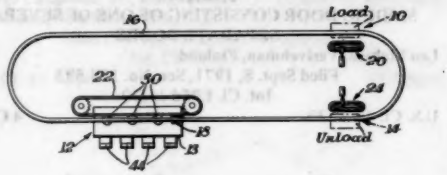
WORK CARRIER FOR ABRASIVE CLEANING ARRANGEMENTS

Bernard W. Ixer, and Davis Lee Baughman, both of Hagerstown, Md., assignors to The Carborundum Company, Niagara Falls, N.Y.

Division of Ser. No. 83,362, Oct. 23, 1970, Pat. No. 3,722,710. This application July 3, 1972, Ser. No. 268,372

Int. Cl. B24c 3/10

U.S. Cl. 51—14 **5 Claims**



A work carrier for use in abrasive cleaning arrangements comprises a support movable in a forward direction with generally vertical work engaging arms having hook-like projections for moving into and out of a work engaging position.

3,769,755

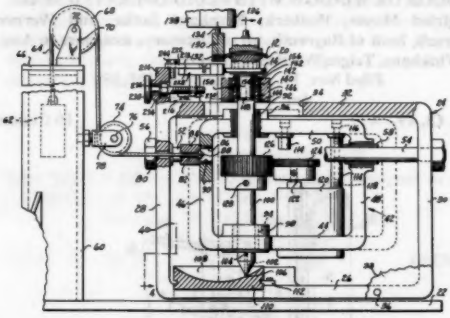
LENS CUTTING AND BEVEL EDGING MACHINE

Albert T. Kania, Sturbridge, and Joseph Jerominek, Webster, both of Mass., assignors to Gentex Corporation, New York, N.Y.

Filed Aug. 6, 1971, Ser. No. 169,634

Int. Cl. B24b 9/14

U.S. Cl. 51—101 LG **12 Claims**



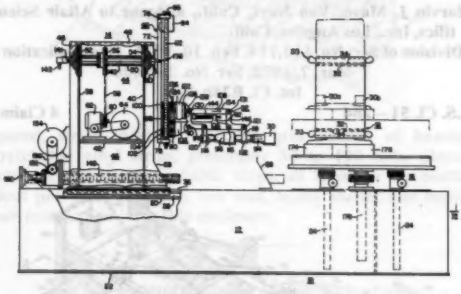
Apparatus for cutting a curved lens blank to a predetermined shape while forming the edge thereof with a vee the apex of which is always at the center of the blank edge and the apex of which is located in the horizontal plane of the blank in which the blank to be cut is rotated relative to a rotating vee cutter at a fixed location while being supported for vertical movement and for horizontal movement relative to the cutter with the vertical movement of the blank being controlled by a cam surface having the same curvature as the blank and being centered on the cutter axis and the horizontal movement of the blank being controlled by a cam having the shape of the configuration to be cut.

3,769,756

AUTOMATIC GRINDING AND MACHINING APPARATUS

Harry P. Kipple, Pittsburgh, Pa.; Francis C. Kapperman, deceased, late of Eggertsville, N.Y. (by Dorothy M. Kapperman, administratrix), and Virgil J. Cozzarin, Clarence, N.Y., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 9, 1971, Ser. No. 170,006
Int. Cl. B24b 5/06
U.S. Cl. 51—43 17 Claims



Apparatus suitable for automatically positioning a stator and grinding a resinous coating from a cylindrical surface of a motor stator or for machining any surface of a member having a portion alignable with the machining or grinding means. The apparatus includes a rotatable horizontal shaft mounted on an upright frame, the frame being movable to and from a stator or member support table, the table being controllably movable vertically, laterally and angularly of the shaft in order to align the axis of a stator or a portion of a member on the table with the shaft, the shaft having a laterally-extending arm on the end nearer the table, a spindle adjustable movable on the arm to any radial position with respect to the shaft, a sensor detachably mounted on the spindle for measuring any non-alignment in any of the vertical, horizontal and angular directions of the stator axis or other member with respect to that of the shaft, operatively associated means between the sensor and the table for adjusting the support table so that the stator axis is brought into coaxial alignment with the shaft, and abrasion or machining means detachably mounted on the spindle and operable, for example, for grinding off a resinous coating on the stator surface as the laterally extending arm is rotated on the shaft and arm moves the abrasion means around and in contact with the stator surface.

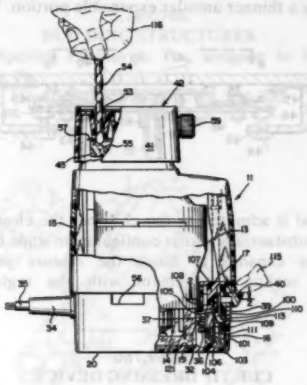
3,769,757

MOMENTARY SWITCH CONTROL

George S. Sunday, Jr., Baltimore, Md., assignor to The Black and Decker Manufacturing Company, Towson, Md.

Filed June 1, 1972, Ser. No. 258,662
Int. Cl. B24b 19/16, 3/26, 47/00
U.S. Cl. 51—102 10 Claims

A portable, double insulated sharpener for drill bits or the like including a stand-up housing having a sharpening wheel driven by an electrically-operated motor. A manually-operable switch actuator is in an optimum position for one-hand actuation and control to energize the motor and sharpening wheel, while the user's other hand is free to hold the drill bit in position. Structure is provided for normally urging the switch to an "off" position so that when manual operation of the switch is terminated, positive control of the sharpener is



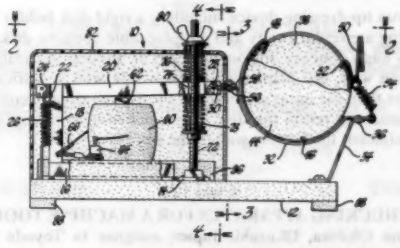
achieved. This affords the user a substantial degree of control over the amount of material being removed when dressing a tool bit or the like.

3,769,758

VIBRATORY STONE POLISHER

Joseph A. McDonald, 8718 Old State Ave., Farewell, Mich.

Filed June 28, 1971, Ser. No. 157,133
Int. Cl. B24b 31/06
U.S. Cl. 51—163 7 Claims



A vibratory stone polisher comprising a base and a laminated arm pivotally mounted on the base to be reciprocally displaced by means of an electromagnet, a bracket connected to the arm and to the base for receiving a cylindrical stone polishing barrel and an arrangement of springs for varying the bilateral resistance to displacement applied to the arm thus to vary the speed of polishing.

3,769,759

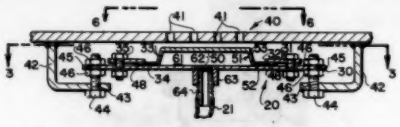
FINISHING MACHINE INCLUDING PRESSURE RESPONSIVE VALVE PERIPHERALLY SEALING TUB DRAIN OPENINGS

John F. Rampe, Cleveland, Ohio, assignor to Rampe Research, Cleveland, Ohio

Filed June 29, 1971, Ser. No. 158,042
Int. Cl. B24b 31/06
U.S. Cl. 51—163 24 Claims

A finishing machine is provided with a pressure responsive valve adapted to peripherally seal a plurality of closely spaced drain openings formed through the lower wall of the vibratory tub. A generally circular diaphragm is clamped between a

base plate and an annular clamping plate. The base plate is apertured to admit the discharge pressurized fluid to and from the chamber defined between the diaphragm and the base plate. The diaphragm includes a circular closure portion surrounded by a thinner annular expansible portion. When pressurized fluid is admitted to the chamber the closure portion retains its substantially planar configuration while the expansible portion expands to move the closure portion into peripheral sealing engagement with the region of the openings.



3,769,760

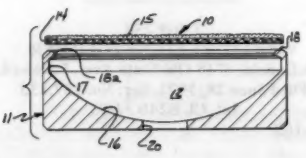
CUE TIP DRESSING DEVICE

Victor J. Kritske, 1705 S. 17th Street, Sheboygan, Wis.

Filed Jan. 12, 1972, Ser. No. 217,353

Int. Cl. B24d *5/00*; **B24b** *5/00*; **B24d** *15/04*

U.S. Cl. 51—204 **2 Claims**



A cue tip dressing device including a rigid disk holder body defining a circular cavity and a replaceable abrasive disk. The cavity has a concave bottom wall and an annular inwardly facing side wall, the diameter of which side wall is sufficiently smaller than the outer diameter of the disk to radially constrict the same and retain the disk in a concavo-convex configuration adjacent the bottom wall of the cavity.

3,769,761

CHUCKING APPARATUS FOR A MACHINE TOOL

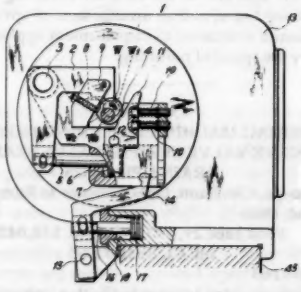
Susumu Ohsima, Okazaki, Japan, assignor to Toyoda Koki Kabushiki Kaisha, Kariya-shi, Japan

Filed July 28, 1972, Ser. No. 275,919

Claims priority, application Japan, July 30, 1971, 46/57742

Int. Cl. B24b *5/02, 5/42, 41/06*

U.S. Cl. 51—237 CS **6 Claims**



In chucking apparatus for a machine tool, such as, for example, a crank pin grinding machine, clamping arms are released a limited distance, relative to a workpiece, during a locating operation, so that the workpiece may be precisely located within the machine's bearing surfaces, in a predetermined angular position by a pressing member relative to a locating stop and reference member. After such locating operation, the clamping arms re-engage the workpiece, thereby fixedly clamping such within the bearing surfaces and readying such for the grinding operation.

3,769,762

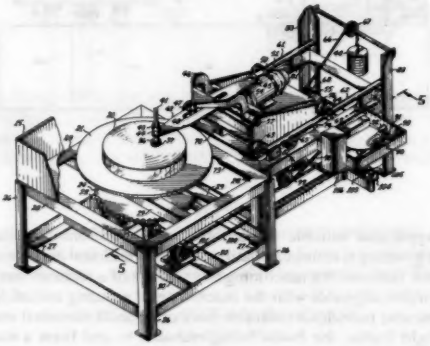
METHOD FOR CONTROLLED LAPPING OF OPTICAL SURFACES TO CORRECT DEVIATIONS FROM DESIRED CONTOURS

Marvin J. Mayo, Van Nuys, Calif., assignor to Altair Scientifics, Inc., Los Angeles, Calif.

Division of Ser. No. 114,114, Feb. 10, 1971. This application Mar. 7, 1972, Ser. No. 232,406

Int. Cl. B24b *1/00*

U.S. Cl. 51—284 **4 Claims**



Apparatus for scanning an aspheric optical surface in a spiral pattern and lapping with short strokes is provided by rotating a table supporting the workpiece at a controlled rate, radially moving an arm carriage, and cyclically driving the arm on the carriage with a crank to produce short lapping strokes along the spiral scanning path. A program prepared from contour deviation plots along several diameters of the workpiece (made by knife-edge measurement techniques) control the rate of rotation of the workpiece inversely proportional to deviations from the desired surface contour. After repeated use of one program has reduced deviations by at least half, measurements are again made and a new program is prepared. Each iteration of a given program is run at a rate which assures completion of the entire program in an interval of time during which the rate of material removal will not vary by more than 10 percent.

3,769,763

AIR INFLATABLE STRUCTURE

John P. Kwake, 2507 Carob Dr., Los Angeles, Calif.

Continuation of Ser. No. 60,038, July 31, 1970, abandoned. This application May 31, 1972, Ser. No. 258,469

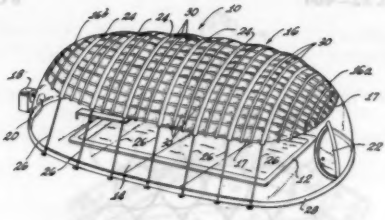
Int. Cl. E04b *1/345*

U.S. Cl. 52—2 **3 Claims**

This disclosure relates to an air inflatable enclosure comprising sheets of unsupported stretchable plasticized polyvinyl chloride or polyvinyl acetate plastic sheet, having a thickness of between about 10 to 20 mils, in combination with (1) a plurality of spaced, parallel non-stretchable reinforcing strips or webs of material fused to at least a portion of the roof surface of the plastic sheet material, the ends of the non-stretchable parallel strips being anchored to decking or to other base material (such as earth and the like) for stability and provided

with (2) a reinforcing grid pattern formed, at least between each of said spaced, parallel strips, the grid pattern being constructed of heavier stretchable vinyl strips fused to the vinyl sheet material.

The combination of non-stretchable reinforcing parallel,



spaced, strips together with the grid pattern of heavier stretchable vinyl strips, preferably 30 to 120 mils, placed between said non-stretchable strips, all fused to the plastic sheet provide a relatively low cost, highly stable, and highly tear-resistant air inflatable enclosure.

3,769,764

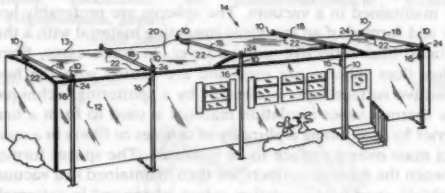
MOBILE HOME HOLDOWN APPARATUS

Ernest L. Young, Rt. 1, Box 348A, Morristown, Fla.

Filed Nov. 1, 1972, Ser. No. 302,925

Int. Cl. E04h *9/14*

U.S. Cl. 52—23 **6 Claims**



A removable mobile home holdown, including pairs of hollow pipes extending into the ground flush with opposing sides of the mobile home. A cross member is secured between each pair of pipes, and each pipe has a crimped end extending into the ground with an auger at the crimped end for anchoring.

3,769,765

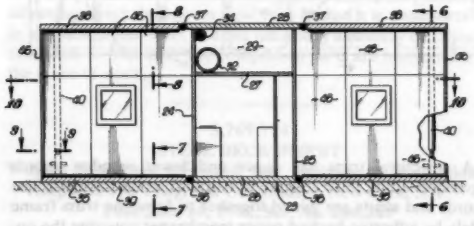
RELOCATABLE BUILDING STRUCTURE

Maurice E. Wright, 4533 Los Feliz Blvd., Los Angeles, Calif.

Filed Jan. 8, 1971, Ser. No. 105,016

Int. Cl. E04b *7/16*

U.S. Cl. 52—69 **2 Claims**



A fixed dimension central building core structure includes roof and floor panels which are retracted to lie closely against the core during transportation. On installation, the roof and floor panels are swung outwardly to a horizontal position and wall panels slidingly interrelate them.

3,769,766

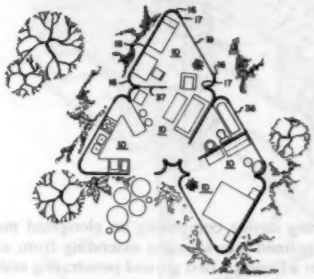
BUILDING STRUCTURES

Elbert O. Speidel, Pittsburgh, Pa., assignor to MHI, Inc., Zelienople, Pa.

Filed Nov. 8, 1971, Ser. No. 196,515

Int. Cl. E04b *1/34*

U.S. Cl. 52—73 **10 Claims**



A building module is provided for assembly into a multiple module building. Each separate module comprises a hollow formed body including at least one generally equilateral triangular horizontal section with spaced apart roof and bottom members connected by arcuate vertical corner members, at least one side wall opening defined by the roof, bottom and corner members and interchangeable fastening means adapted selectively to fasten adjacent modules together and to fasten an insert in said opening.

3,769,767

COMPOSITE PANEL STRUCTURES

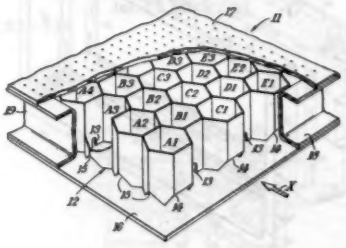
Joseph James Scott, Newtownards, Northern Ireland, assignor to Short Brothers & Harland Limited, Belfast, Northern Ireland

Claims priority, application Great Britain, July 10, 1970, 33711/70.

Filed July 9, 1971, Ser. No. 161,066

Int. Cl. E04c *2/36*

U.S. Cl. 52—145 **2 Claims**



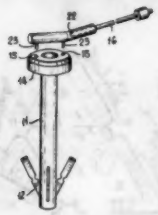
A composite structure manufactured from a cellular core formed by a plurality of rows of contiguous cells by cutting away from each of the end cells forming an edge of the core a portion or portions thereof. The edge of the core is closed by a flat edge member so that the cut-away portions provide a passage along the edge cellular core. Each cell of a row is provided with a communicating aperture to an adjacent cell of the row or each adjacent cell of the row. The cellular core is sandwiched between two facing sheets. In this way a panel is formed in which water can pass through the cellular core of the panel by way of the passages and apertures to a point at which a drain hole is provided.

3,769,768

ANCHORING DEVICE

Jean Jacques Bertrand, 11, Rue de Breban 51, Epernay, France

Filed May 24, 1972, Ser. No. 256,439
Claims priority, application France, May 25, 1971, 7118762
Int. Cl. E02d 5/80
U.S. Cl. 52—154 1 Claim



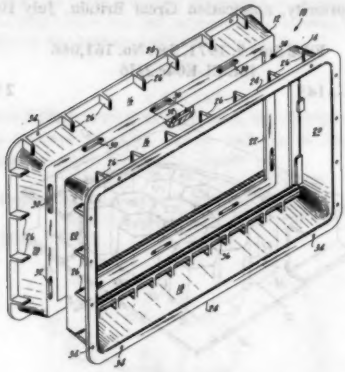
An anchoring device comprising an elongated member, a plurality of inclined lateral vanes extending from said elongated member adjacent a first ground penetrating end thereof, said vanes each forming an acute angle with the axis of said elongated member and being provided with a weakened portion intermediate its length whereby rotation of said elongated member after insertion in the ground will result in the bending of said vanes and head means on the second end of said elongated member for enabling the rotation of said member.

3,769,769

PERMANENT BASEMENT WINDOW FRAME AND POURING BUCK

William J. Kohl, P.O. Box 354, Elkhart Lake, Wis.

Filed Mar. 2, 1972, Ser. No. 231,340
Int. Cl. E06b 1/30, 1/60
U.S. Cl. 52—212 6 Claims



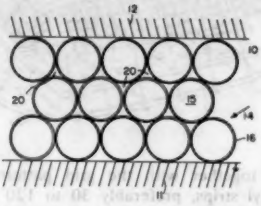
A window buck adapted to be permanently embedded in a poured concrete wall, the buck including identical half sections molded from a plastic material and having top, bottom and end walls forming a window enclosure. Each half section being adapted to be mounted on the concrete wall mold forms for assembly in a back-to-back relation, interengaging elongate members and recesses are provided on the back sections for mating engagement on assembly. The half sections being substantially identical and adapted to be stored in a nested relation.

3,769,770

THERMAL SUPER INSULATION

Nicholas Howard Deschamps, Reeds Ferry, and Gerald L. Bernier, Hudson, both of N.H., assignors to Sanders Nuclear Corp., Nashua, N.H.

Filed Jan. 23, 1969, Ser. No. 793,407
Int. Cl. E04b 1/76
U.S. Cl. 52—404 8 Claims



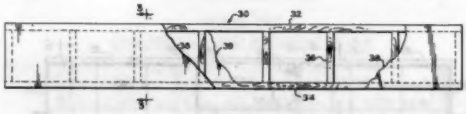
Thermal super insulation is formed by utilizing highly heat reflective, thin layers on bases under vacuum conditions to increase radiation reflection and decrease radiation heat transfer through the insulation. Thermal super insulation preferably comprises a plurality of extremely small spheres of a hard, low thermal conductivity material grouped together in point contact with adjacent spheres. The spheres are individually coated with a thin layer of a highly heat reflective, low emissivity material. Interstitial spaces between the spheres are maintained in a vacuum. The spheres are preferably hollow and formed of an inorganic insulating material with a thin metallic heat reflective surface layer. In some cases, fibers rather than spheres are used and are coated with the heat reflective surface layer preferably by a sputtering technique. The thermal super insulation material is used to form a heat barrier by positioning a plurality of spheres or fibers in a compact mass over a surface to be insulated. The spaces formed between the spheres or fibers are then maintained in a vacuum to obtain good heat insulation values when used in extremely high temperature applications.

3,769,771

STRUCTURAL TRUSS CONSTRUCTION WITH MEMBRANE COVERINGS

Michael J. Shannon, 13u Greenwood Ave., Bend, Oreg., and George C. Sheldon, 3033 N.W. Quimby St., Portland, Oreg.

Filed Aug. 12, 1971, Ser. No. 171,214
Int. Cl. E04c 3/14, 3/29
U.S. Cl. 52—634 1 Claim



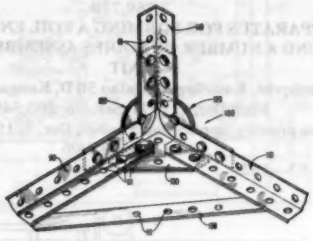
A structural truss has upper and lower wooden chords separated along their lengths by vertical wooden struts. The chords and struts are joined together to form the truss frame solely by adhesive-backed paper membranes covering the opposite sides of the frame so as to transmit tensile stresses within the frame. The truss may be manufactured in multiples of various lengths by a continuous assembly line process.

3,769,772

STRUCTURAL ASSEMBLIES

Hans Oetiker, 21 Oberdorferstrasse, Horgen, Switzerland

Filed Oct. 30, 1969, Ser. No. 872,554
Int. Cl. E04h *12/08*; E04g *5/04*; E04a *9/06*
U.S. Cl. 52—646 23 Claims



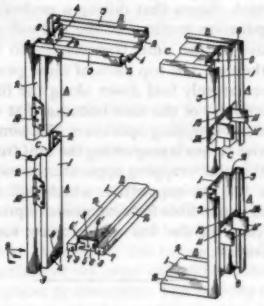
A structural assembly made from standardized parts of identical thickness and provided with apertures that are regularly spaced with great accuracy; the parts are detachably connected with each other utilizing the apertures whereby the profile members of a corner for the assembly are held together exclusively by three plates or by one plate and two pivotal connections, also detachably secured by the use of their apertures.

3,769,773

COLLAPSIBLE DOOR-FITTING FRAME

Mitsuo Mochizuki, 10, Kamikosakamachi 3-chome, Higashiosaka, Japan

Filed June 5, 1972, Ser. No. 259,772
Int. Cl. E04c *2/38*
U.S. Cl. 52—656 4 Claims



This invention provides a door-fitting frame of collapsible type which is mounted securely in a door opening provided in a concrete wall and in which a door is fitted later. This frame, very simple in construction and easy in fabrication, offers an advantage over the known rigid type in that it is transportable in a disassembled state and the necessary assembly or fabrication work is done after the component parts are transported to the place of work.

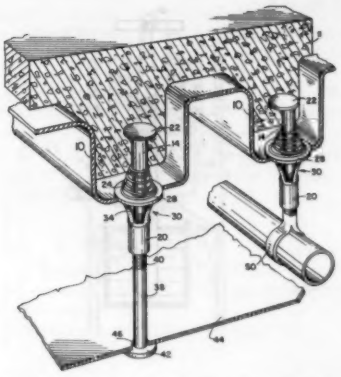
3,769,774

STEEL DECK INSERT

William R. Barnes, Highland, Ind., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed June 26, 1972, Ser. No. 266,387
Int. Cl. E04b *1/41*
U.S. Cl. 52—698 11 Claims

An elongate bolt having a head at its upper end and a threaded lower end is mounted through a corrugated sheet steel member of a steel floor deck. The threaded lower end comprises a stud formation which carries an elongate nut which provides a downwardly opening interior threaded socket. The bolt is mounted in a hole drilled in the horizontal portion of the corrugated sheet steel member and is held in place by the resilient splayed fingers of a ring engaging the bolt below the sheet of steel and a helical spring backed against a shoulder of the bolt and engaging the upper surface of the corrugated sheet of steel through a large washer. When concrete is poured on the upper surface of the sheet steel member and set, it will embed the upper portion of the bolt. Prior to pouring, however, the upper portion of the bolt is yieldable by reason of the helical spring but recoverable to a position perpendicular to the plane of the sheet steel member.

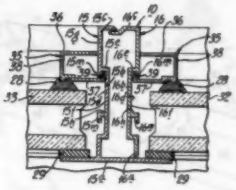


3,769,775

BUILDING WALL CONSTRUCTION

Kazimierz J. Brzezinski, Willowdale, Ontario, Canada, assignor to American Metal Climax Inc., New York, N.Y.

Continuation of Ser. No. 881,070, Dec. 1, 1969, abandoned, which is a division of Ser. No. 730,530, May 20, 1968, Pat. No. 3,527,010. This application Oct. 8, 1971, Ser. No. 187,901The portion of the term of this patent subsequent to May 20, 1985, has been disclaimed.
Int. Cl. E04b *2/88*
U.S. Cl. 52—731 2 Claims



There is provided an improved building wall construction including a thermal expansion type split mullion. The mullion includes a continuous face member against which opposed panels are glazed with glazing tape as the seam end weathering. This eliminates the seam between the mullion halves from the exterior face of the mullion assembly altogether, protecting the seam from the weather, and reducing the vulnerable sealing lines exposed to the weather.

3,769,776

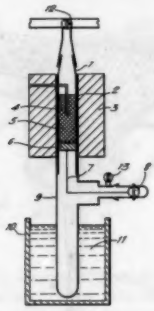
METHOD FOR THERMAL ACTIVATION OF A SURFACE ACTIVE MATERIAL

Ronald Berg, Oslo, Norway, assignor to Institutt for Atomenergi, Kjeller, Norway

Continuation of Ser. No. 838,887, July 3, 1969, abandoned. This application Feb. 22, 1972, Ser. No. 228,335

Int. Cl. B01d *15/08*

U.S. Cl. 55—67 **5 Claims**



The present invention relates to a method for thermal activation of a surface active material, mainly for the purpose of increasing the gas sorption ability of the material. It is previously known to improve the sorption ability by heating the sorption agent to a temperature, preferably above 300° C and thereafter slowly cooling said agent to room temperature. According to the invention, however, the slow cooling is replaced by a quenching to a temperature below −75° C, for example, in liquid nitrogen or helium.

This activation method has proved to give more efficient sorption agents for several gases, but especially for nitrogen and xenon.

3,769,777

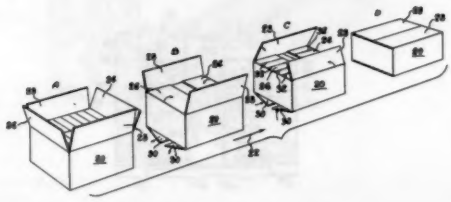
CASE SEALER

Joseph A. Miller, Englewood; Frank A. Kruglinski, Fort Lee, and Anthony Freakes, Leonia, all of N.J., assignors to General Corrugated Machinery Co., Inc., Palisades Park, N.J.

Filed June 21, 1972, Ser. No. 264,995

Int. Cl. B65b *57/00, 7/20*

U.S. Cl. 53—76 **6 Claims**



A machine for automatically sealing both the top and bottom flaps of cases of random sizes with product contained therein wherein the length, height and width of each case is automatically sensed and the machine is adjusted to define a case path therethrough, the bottom side flaps are dropped open sufficiently to permit adhesive to be applied to the inner bottom flaps and are supported to prevent the product from dropping therefrom, adhesive is applied to the inner top flaps and inner bottom flaps substantially simultaneously, and including means for folding the top side flaps and the bottom side flaps over the inner flaps and means for holding the case in a compressed state until the adhesive sets. The length of the adhesive line on the inner flaps is set in accordance with the width of the case in order to preclude application of adhesive to the product.

3,769,778

APPARATUS FOR FORMING A FOIL ENVELOPE AROUND A NUMBER OF BODIES ASSEMBLED INTO A UNIT

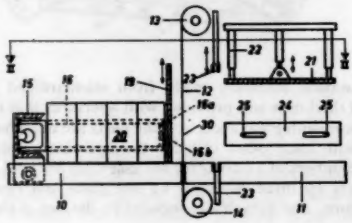
Jack Nordqvist, Kastellegardsgatan 50 D, Kungalv, Sweden

Filed Dec. 1, 1971, Ser. No. 203,549

Claims priority, application Sweden, Dec. 7, 1970, 16489/70

Int. Cl. B65b *9/06*

U.S. Cl. 53—182 **4 Claims**



A manner of forming a number of bodies into a parallelepipedic unit suitable for handling and transporting, and applies a wrapping to an assembled unit in a weldable foil, which by a movement of the unit in the horizontal plane is first wrapped around three sides of the unit, then welded along the fourth side thereof and finally welded along the fifth and sixth sides to form a closed cover, which possibly may be heat shrunk. The foil originally has a breadth greater than that of the unit, which means that during a preliminary step of the wrapping operation portions of the foil will protrude outside opposite sides of the unit, transversely to the direction of movement thereof. The top parts of these protruding portions must not prematurely fold down along the fifth and the sixth sides, respectively, of the unit because that would block the final steps of the wrapping operation. The aim of the invention is to design the means transporting the unit from one station to an other within the wrapping apparatus in such a manner that parts of the foil are supported, which will facilitate the introduction of expandible fork members required to spread the protruding parts of the foil and prepare same for the final welding operation.

ERRATUM

For Class 55—67 see:
Patent No. 3,769,776

3,769,779

DEGASSING APPARATUS

Walter E. Liljestrand, Midland, Tex., assignor to Smith International, Inc., Newport Beach, Calif.

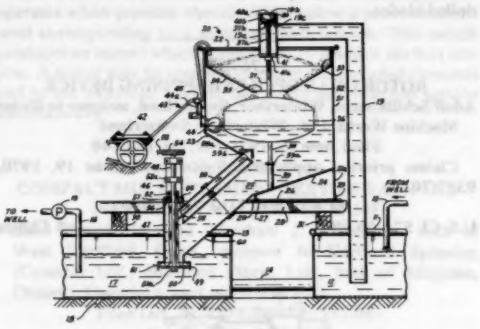
Filed Sept. 27, 1971, Ser. No. 183,775

Int. Cl. B01d *19/00*

U.S. Cl. 55—166 **18 Claims**

An apparatus for degassing fluids, particularly drilling muds, comprising a vessel having an inlet and an outlet for the intake and discharge of the fluid to be treated, a centrifugal pump connected to the vessel for circulating the fluid through the vessel and means for removing gas from the region of the impeller means in the centrifugal pump. The invention also includes a centrifugal pump designed for handling gas laden fluids, the pump having a means for removing gas from the re-

gion of the pump impeller. The invention further includes a centrifugal pump for handling corrosive and/or abrasive fluids



wherein said fluids are prevented from contacting the pump seal by means of a gas pressurized compartment adjacent the seal.

3,769,780

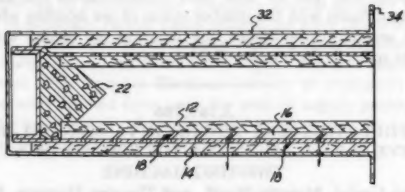
PARTICLE FILTER-SOUND MUFFLER

Walter Kasten, Franklin, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Nov. 23, 1971, Ser. No. 201,481

Int. Cl. B01d *46/24*

U.S. Cl. 55—276 **5 Claims**



An inflatable safety cushion device for protecting vehicle passengers that includes a filter-muffler for removing any potentially harmful particles from air flowing into an inflating bag, and for reducing the noise level of the inflating air flow. The filter-muffler comprises a first cylindrical filter element encircling a second cylindrical filter element. A perforated, hexagonal, metallic tube is disposed between the two cylindrical filter elements. The sides of this hexagonal tube cooperate with the inner surface of the outer cylindrical filter element to define six open spaces or chambers. The velocity of air flowing through perforations in the hexagonal element is reduced as the air enters an open chamber. This velocity reduction reduces the noise level of the air flow. The hexagonal element is elastically deflected by a high velocity pulse of air passing through the filter-muffler. This deflection absorbs energy and further reduces the noise level of the air flow.

3,769,781

APPARATUS FOR DRYING STEAM IN NUCLEAR POWER STEAM GENERATORS PLANTS

Heinrich Klein; Rudolf Pieper, both of Erlangen, and Alfred Hoffmann, Forchheim, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

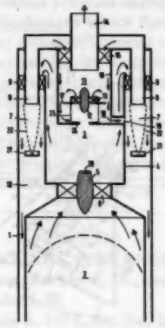
Filed Oct. 12, 1971, Ser. No. 188,258

Claims priority, application Germany, Oct. 20, 1970, P 20 51 310.4

Int. Cl. B04c *3/06, 5/26, 5/28*

U.S. Cl. 55—261 **10 Claims**

Apparatus for drying the steam of a steam-water mix generated by a steam generator has an axial cyclone arranged above the steam generator for separating at least a portion of the water from the steam-water mix so as to yield separated water and a remaining steam-water mix and for passing the water and the remaining mix in an upward direction. A plurality of counter-flow cyclones for receiving therein the separated water separated from the mix in said axial cyclone are also provided and each of the counter-flow cyclones has a wall defining a turbulence chamber, a tube extending into the chamber, and inlet guide vanes disposed concentric to the



tube for imparting a spin motion to the separated water for separating the latter into water and clarified steam in the chamber. A tornado-flow separator for separating the remaining mix into additional water and clarified steam is disposed above and coaxial with the axial cyclone. The tornado-flow separator has a lower axial inlet for admitting the remaining mix as well as having an upper outlet for discharging clarified steam. The tornado-flow separator also has an upper auxiliary gas inlet coaxial with the upper outlet for admitting the clarified steam separated in the counter-flow cyclones.

3,769,782

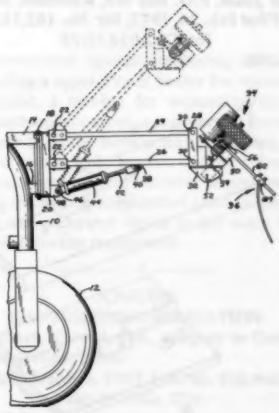
CORN DETASSELING HEAD

Paul L. Cler, c/o Paul's Machine & Welding, Villa Grove, Ill.

Filed Feb. 11, 1972, Ser. No. 225,476

Int. Cl. A01d *47/00*

U.S. Cl. 56—51 **7 Claims**



Corn detasseling apparatus for mounting on a vehicle frame to be moved thereby to a field of corn and detassel the same. The apparatus includes a pair of cleated tires in engagement with each other and driven in opposite directions so as to

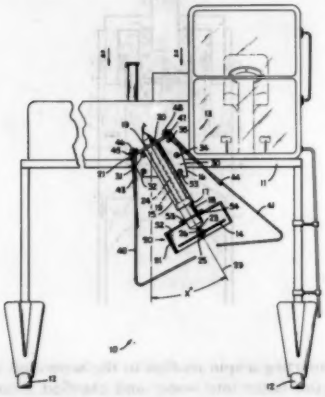
define a tassel receiving nip which may receive the tassel on a stalk of corn and move the same upwardly to pull it from the corn plant.

3,769,783

SINGLE DISC CORN STALK CUTTER

Roy H. Meharry, R.R.1, New Richmond, Ind.

Filed Feb. 23, 1972, Ser. No. 228,565
Int. Cl. A01d *45/02*
U.S. Cl. 56—63 **6 Claims**



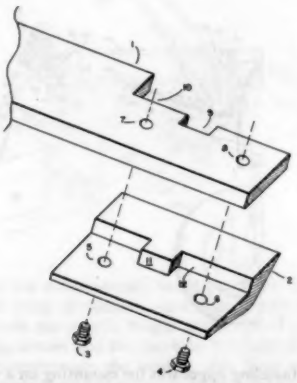
A cutting apparatus for severing corn stalks. A single saw-type circular blade is rotatably driven in one embodiment by an electric motor and in another embodiment by a hydraulic motor. Each motor is mounted to a cylindrical tube suspendedly mounted from a plate which is attached to a wheeled vehicle. The plate may be located in a first position providing for the blade axis of rotation to intersect the vertical at an acute angle. The plate may be alternatively located in a second position so the blade axis of rotation will be parallel with the vertical. A safety guard is mounted to the tube partially surrounding the blade and pair of rods mounted to the plate extend outwardly forming a corn stalk funnel to the cutting blade.

3,769,784

ROTARY MOWER BLADES

Stanley Adair Jones, P.O. Box 103, Kaufman, Tex.

Filed Feb. 24, 1972, Ser. No. 182,112
Int. Cl. A01d *55/18*
U.S. Cl. 56—295 **4 Claims**



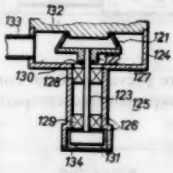
This invention relates to the farm implement known as a rotary mower and provides detachable cutting blades which are mounted on the modified outer ends of existing blades enabling the operator to use higher quality cutting edges and allowing easy and quick interchangeability of sharpened for dulled blades.

3,769,785

ROTOR OF AN OPEN END SPINNING DEVICE

Adolf Schiltknecht, Winterthur, Switzerland, assignor to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed June 15, 1971, Ser. No. 153,240
Claims priority, application Switzerland, June 19, 1970, 9317/70
Int. Cl. D01h *1/12, 7/12, 7/20*
U.S. Cl. 57—58.89 **5 Claims**



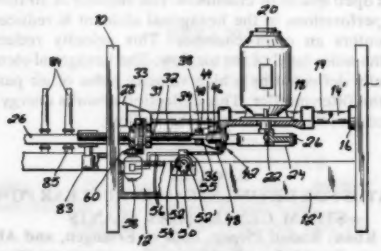
A room or space is provided between the exterior room or space of the spinning device and the clearance gap for the rotor shaft so as to bypass the air flow around the rotor shaft bearings. This reduces the possibility of contamination of the bearings and lubrication leakage from the bearings. In another embodiment, the air flow path communicates the exterior room directly with the interior space of the housing while, in still another embodiment, the bearings are sealed into the same space as the interior of the housing.

3,769,786

REGULATING BELT TENSION IN TANGENTIAL-BELT DRIVE ARRANGEMENT FOR THE WHORLS OF A YARN-TWISTING MACHINE

Aloys Greive, Munster/Westf., and Theodor Tiemann, Bosensell/Munster, both of Germany, assignors to Hamel G.m.b.H. Zwirnmaschinen, Munster/Westf., Germany

Filed Mar. 1, 1972, Ser. No. 230,682
Claims priority, application Germany, Mar. 2, 1971, P 21 09 888.4
Int. Cl. F16h *7/10*; **D01h** *13/20*
U.S. Cl. 57—105 **10 Claims**



A drive motor of a tangential drive for the whorls of a yarn-twisting machine, and its drive pulley are carried on a slider on a fixed support. A pair of threadedly interengaged elements are braced between the slider and the support such that on rotation of one of the elements relative to the other the slider is displaced relative to the support and belt tension is adjusted. A piston-and-cylinder arrangement as a fluid-pressure mea-

suring device or detector is provided between the elements and the slider to sense the pressure they exert against the slider. A switch is connected to this piston and cylinder and operates when pressure therein drops below a predetermined level corresponding to a minimum belt tension. This switch produces an output which is employed to readjust the belt tension. A motor may be coupled to one of the threaded elements and to the switch to operate this motor and readjust tension automatically.

3,769,787

COMPACT MULTI-FILAMENT TEXTILE YARN AND METHOD OF MAKING THE SAME

Nathan Rosenstein, and Abraham J. Rosenstein, both of West Hartford, Conn., assignor to Hartford Spinning (Canada) Ltd.; Hartford Fibres Ltd., both of Kingston, Ontario, Canada; a part interest to each

Filed Oct. 26, 1971, Ser. No. 192,081
Int. Cl. D02g *3/26, 3/38*
U.S. Cl. 57—144 **16 Claims**

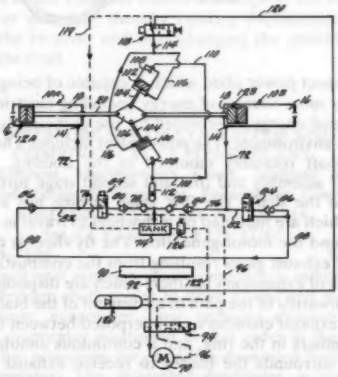
The filaments of multi-filament synthetic textile yarn are rendered and maintained sufficiently coherent and compact for high-speed fabricating purposes such as knitting, winding and weaving by continuously disposing special wrapper filaments in generally helical paths around the core filaments of the yarn, at least one such wrapper filament being disposed in a clockwise manner and another wrapper filament counterclockwise. The wrapper filaments (drawn or undrawn) are continuously applied from over the ends of supply packages, or at the spinneret or otherwise, and if undrawn may be drawn concurrently with the core filaments.

3,769,788

LOW POLLUTION, HIGH EFFICIENCY PRIME MOVER SYSTEM AND PROCESS

George W. Korper, III, Woodbridge, Conn., assignor to Conservor, Inc., New Haven, Conn.

Filed Mar. 9, 1972, Ser. No. 233,235
Int. Cl. F02b *41/00, 53/00*
U.S. Cl. 60—19 **39 Claims**



An engine system obtains maximum useful energy output from an internal combustion process by maintaining a substantially constant volume within a combustion zone during a completion of the combustion process and by providing for a nearly complete expansion of heated gas after completion of the combustion process. The engine includes a piston mounted for movement within a chamber, and the piston is retarded from initiating an expansion stroke movement until nearly theoretical maximum pressure and heat conditions are developed within a combustion zone within the chamber. Thereafter, the piston is released to apply a motive force to a volume of hydraulic fluid contacted by the piston within the same chamber. The expansion stroke of the piston is substantially longer than its compression stroke. A specific embodiment provides for constant pressure delivery of hydraulic fluid by auxiliary hydraulic devices which function to maintain a substantially constant force differential on opposite sides of the piston during its expansion stroke travel.

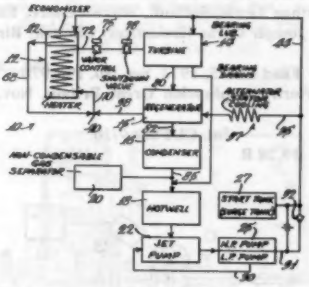
A new practical working cycle designated the "Korper" cycle extracts as mechanical energy, thermal energy wasted in previous internal combustion, attempted constant volume designs such as the Otto or Atkinson cycles by providing for complete combustion prior to expansion and a longer expansion than compression stroke.

3,769,789

RANKINE CYCLE ENGINE

Richard E. Niggemann, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed July 6, 1971, Ser. No. 159,804
Int. Cl. F01k *25/00*
U.S. Cl. 60—36 **12 Claims**



A power conversion system employing an organic fluid, toluene, including a supercritical heater for vaporizing the organic feed liquid, a turbine for expanding the vapor and providing a mechanical output, a regenerator for receiving superheated vapor from the turbine and preheating a portion of the feed liquid to the main heater, and an economizer built around the main heater for preheating a portion of the feed liquid, cooling the exiting combustion gases in the economizer and directing the preheated liquid to the main heater along with feed liquid from the regenerator.

3,769,790

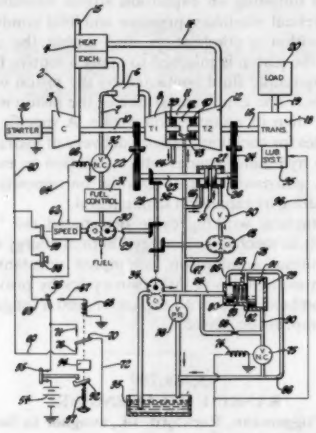
GAS TURBINE LUBRICATION

Glenn W. Thebert, Carmel, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 20, 1972, Ser. No. 235,966
Int. Cl. F02c *7/26*
U.S. Cl. 60—39.08 **3 Claims**

A gas turbine engine includes an electric starter and an engine-driven pump for supplying lubricating and cooling oil to the engine, including supplying it to bearings which are located in a relatively enclosed and hot part of the engine. The pump also supplies oil to a power transfer clutch included in

the engine. The oil pump is disabled while the engine is being cranked by the starter and also for a time after fuel is cut off to



shut down the engine. The supply of lubricating oil is interrupted by a dump valve connected to the outlet of the engine-driven lubricating oil pump.

3,769,791

FUEL SUPPLY SYSTEMS FOR GAS TURBINE ENGINES

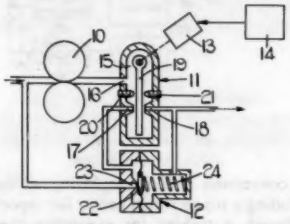
Geoffrey Arthur Lewis, Solihull, Warwickshire, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Nov. 5, 1971, Ser. No. 195,970

Claims priority, application Great Britain, Nov. 7, 1970, 53,091/70

Int. Cl. F02c *9/10*

U.S. Cl. 60—39.28 R **16 Claims**



A fuel supply system for a gas turbine engine has a positive-displacement pump driven by the engine a valve downstream of the pump having an inlet and two outlets. A control element varies flow through the two outlets simultaneously. One of the outlets supplies fuel to the engine and the other outlet communicates with a pressure-responsive spill valve with the low pressure side of the pump. The spill valve arrangement is such that the pressures at the valve outlets remain substantially equal.

3,769,792

CONTROL SYSTEM FOR A TURBINE ENGINE

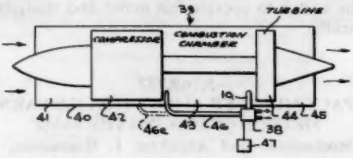
Jerry Grey, 359 W. 21st St., New York, N.Y.

Division of Ser. No. 862,247, Sept. 30, 1969, Pat. No. 3,665,763. This application Mar. 21, 1972, Ser. No. 236,605

Int. Cl. F02c *9/08*

U.S. Cl. 60—39.28 T **14 Claims**

A probe for diagnosing the properties of a high temperature gas including a body having a first fluid passageway for receiving a gas sample therethrough, the body having a second fluid passageway for circulating a coolant therethrough in heat transfer relation with the gas sample flowing through the first fluid passageway, the body having a third fluid passageway disposed between the second fluid passageway and the environment of the body for thermally insulating coolant flowing in the second fluid passageway, from the environment of the body, the passageways having means for providing fixed flow rate ratios, and means for measuring the temperature rise of the coolant flowing in the second fluid passageway.



3,769,793

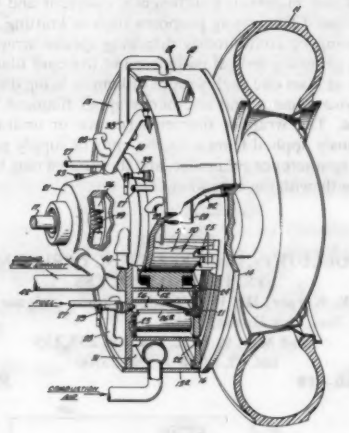
POWER PLANT

Frank H. Wilson, 545 Store Rd., RD 1, Harleysville, Pa.

Filed Aug. 2, 1972, Ser. No. 277,155

Int. Cl. F02c *3/10*

U.S. Cl. 60—39.16 R **9 Claims**



A compact power plant which is capable of being operated by one or more sources of energy, including electrical energy and thermal energy, is provided for use particularly in an automotive environment. The power plant includes a housing, an output shaft rotatably mounted in the housing, a motor-generator assembly and first and second stage turbines connected to the shaft. The first stage turbine has a series of blades which are mounted on a flywheel to travel in a circular path around the motor-generator. The flywheel is rotated by means of exhaust gases resulting from the combustion of fuel in a series of expansion chambers which are disposed in a ring located inwardly of the path of movement of the blades. A like series of exhaust chambers are interposed between the expansion chambers in the ring, and a continuous annular exhaust receiver surrounds the blades to receive exhaust gases expelled from the exhaust chambers. Inner and outer cylindrical partitions are provided on opposite sides of the path of movement of the blades and sealing means is provided at spaced intervals between groups of blades to prevent the leakage of combustion gases directly from the expansion chambers and

to the exhaust chambers. An air-fuel mixture is ignited simultaneously in the expansion chambers by means of igniters, and the air is preheated before combustion as it flows through a conduit located in the exhaust receiver. A portion of the combustion air is admitted to the exhaust chambers to effect scavenging and further combustion of exhaust gases. The rotor of the second stage turbine is connected to the shaft and is supplied with exhaust gases by conduits leading from the exhaust receiver. The power plant is capable of generating electricity for storage in a battery when the turbines rotate the shaft; or, the shaft is capable of being driven by electricity supplied to the motor-generator assembly from a battery.

3,769,794

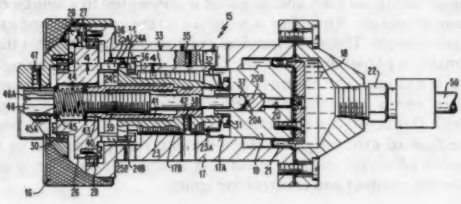
MANIPULATION APPARATUS

Rene P. Cachon, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 31, 1970, Ser. No. 24,258

Int. Cl. F15b *7/00*; **F01b** *31/00*, *7/10*

U.S. Cl. 60—594 **12 Claims**



This patent discloses apparatus for effecting changes in the position of a workpiece, the apparatus comprising a transmitter or control unit which is coupled to a remotely positioned manipulator or receiver. Each of the transmitter and receiver includes a chamber, the chamber of the transmitter being connected to the chamber of the receiver by tubing and the like. In the chamber of the transmitter is means to effect large volumetric changes in the volume of the chamber and separate means to effect small changes in the volume of the chamber, in the disclosed illustration a pair of concentrically disposed pistons. In the chamber of the receiver is another piston which is coupled to output means such as a shaft so that, upon filling the chambers associated with the transmitter and receiver with a liquid, both large and small volumetric changes in the transmitter chamber effected by one or both of the pistons in the chamber causes a change in the volume in the receiver chamber, thereby causing displacement of the piston in the receiver and thus changing the position of the output of the shaft.

3,769,795

MULTIPRESSURE STEAM SYSTEM FOR UNFIRED COMBINED CYCLE POWERPLANT

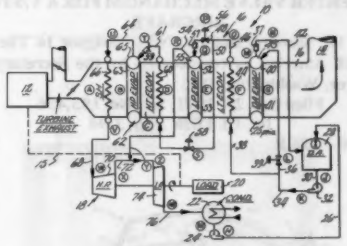
Eric G. Rostrom, Marlborough, Conn., assignor to Turbo Power and Marines Systems, Inc., Farmington, Conn.

Filed Mar. 22, 1972, Ser. No. 236,916

Int. Cl. F22d *1/00*; **F22b** *37/48*

U.S. Cl. 60—106 **13 Claims**

An exhaust heat recovery steam generator is utilized exclusively to develop shaft power to drive a load and includes a high pressure evaporator, low pressure evaporator and deaerator evaporator positioned in that order in the exhaust stack and has provisions for providing deaerated feedwater to each evaporator. The deaerated feedwater is conducted through a split flow system to the low pressure and high pressure evaporator, and preferably also to the deaerator evaporator, to permit individual chemical treatment of the feedwater being provided exclusively to each evaporator so that deaerated and optimally chemically treated feedwater can be passed through each evaporator to abate corrosion and fouling therein. The feedwater is passed through each evaporator at a temperature above the condensation point of the exhaust gas passing thereover. All steam generated by the low pressure and high pressure evaporators is provided exclusively to a



steam turbine to drive a shaft driven load and the deaerator evaporator providing steam solely to heat and deaerate the feedwater. The system is optimized in that the pressure levels for high and low pressure evaporators are optimized to produce the maximum practical steam turbine power from the energy in the gas turbine exhaust.

3,769,796

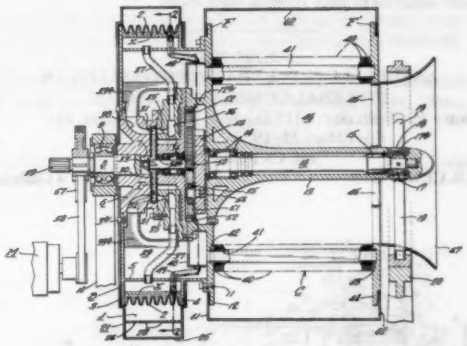
ROTARY HEAT ENGINES

Max F. Bechtold, Kennett Square, Pa., assignor to E.I. du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 10, 1971, Ser. No. 206,779

Int. Cl. F01k *11/00*, *11/02*

U.S. Cl. 60—108 **26 Claims**



A rotary closed Rankine cycle engine including rotary closed housing containing a boiler and an expander, and a condenser connected to the housing, all rotatable as a unit about a common axis. The boiler is of annular construction and the housing and boiler are rotationally driven at a predetermined speed to maintain in the boiler an annular body of liquid having a liquid/vapor interface spaced a predetermined distance radially outward from the engine axis. The condenser is mounted coaxially adjacent the housing to rotate therewith as a unit about the engine axis. The expander actuates a coaxial driving member in the rotary housing and an occluded fixed ratio gear train mounted coaxially within the rotatable housing is driven by the expander driving member and connected to and communicating with the rotary housing-boiler-condenser unit to rotationally drive the latter at said predetermined speed. An external drive member is connected to the rotary housing and rotationally driven thereby, and

means is provided opposing the reaction torque generated by the internal gear train so that the power output of the expander is transmitted directly to the rotary housing and the external drive member.

3,769,797

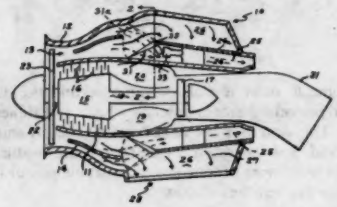
BY-PASS ENGINE HAVING A SINGLE, THRUST DIVERTER VALVE MECHANISM FOR A V/STOL AIRCRAFT

Emerson W. Stevens, Buffalo, N.Y., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 28, 1971, Ser. No. 193,436

Int. Cl. F02k *1/20, 3/04*

U.S. Cl. 60—226 R **1 Claim**



A thrust diverter valve assembly for a bypass engine including a plurality of flap elements pivotally mounted for alternate adjustments between a first position diverting bypass flow to a straight-through passage for augmenting the main thrust being developed, and a second position diverting the bypass flow to a vertical-takeoff-and-landing mode of operation. Hinged sections provide sealing between adjacent flap elements, and serve as flow-straightening vanes when the flap elements have been adjusted to their vertical flight mode.

3,769,798

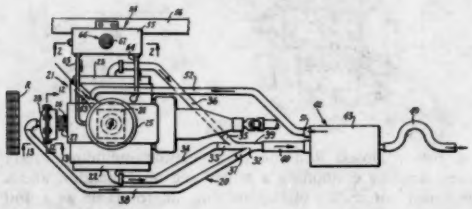
ANTI-POLLUTION EXHAUST SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Henry C. Whittaker, 6117 Garfield St., Hollywood, Fla.

Filed Mar. 22, 1972, Ser. No. 237,032

Int. Cl. F02m *25/06*

U.S. Cl. 60—279 **4 Claims**



An anti-pollution exhaust system for an internal combustion engine in which the exhaust gases are first diluted and then are fed through a spiral pipe serving as a centrifugal separator to separate the heavier gaseous material from the lighter gaseous material. The heavier gaseous material is fed back to the air inlet of the carburetor to be burned in the engine. Fumes from the crankcase are fed to a condensing unit in which the liquid oil is retained until drained off with the remaining fumes being fed to the air inlet of the carburetor to be burned in the engine.

3,769,799

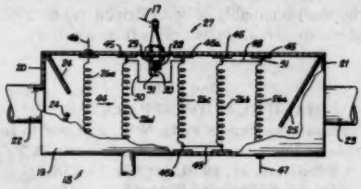
EXHAUST POLARIZING APPARATUS

Norris B. Culp, 202 S. Third Ave., Beechgrove, Ind.

Filed Jan. 22, 1971, Ser. No. 108,852

Int. Cl. F01n *3/14*

U.S. Cl. 60—303 **2 Claims**



Apparatus for polarizing exhaust gases. A polarizing container having an inlet and an outlet is connected to a source of compressed air. An igniter is mounted to the container and extends therein. Thermal electrical coils are mounted within the container perpendicular to the flow of exhaust gases through the container. The thermal electrical coils heat the exhaust gases which are combined with the compressed air and ignited. Deflectors are mounted within the container for guiding the flow of exhaust gases. An induction coil connected to a source of direct current electrical energy has a core with movable contact and controls the igniter.

3,769,800

HYDRAULIC SYSTEM

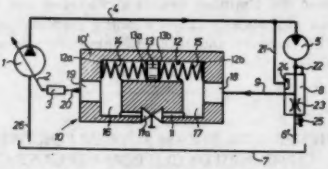
Sigbert Winter, Heidenheim, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed May 11, 1972, Ser. No. 252,241

Claims priority, application Germany, May 12, 1971, P 21 23 404.8

Int. Cl. F16h *39/46*

U.S. Cl. 60—445 **8 Claims**



A hydraulic system has an adjustable hydraulic pump which feeds a hydraulic motor through a first conduit. A pressure sensitive valve is connected to the hydraulic discharge point of the motor. The pressure sensitive valve includes a spring biased closure means which communicates the pressure in the first conduit to a second conduit the latter of which cooperates with the hydraulic motor to adjust the pumping of the same. A hydraulic correcting valve is connected in series with the second conduit and has a proportional-derivative characteristic so that the motor output is initially reduced to a greater extent than thereafter in response to opening of said closure means.

3,769,801

MASTER CYLINDER ASSEMBLIES FOR HYDRAULIC BRAKING SYSTEMS

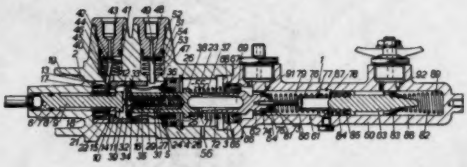
David Anthony Harries, Solihull, England, assignor to Girling, Limited, Birmingham, England

Filed Sept. 16, 1970, Ser. No. 72,769

Claims priority, application Great Britain, Sept. 6, 1969, 45,563/69

Int. Cl. F15b 7/00

U.S. Cl. 60—547 7 Claims



A master cylinder assembly for an hydraulic braking system comprises an hydrostatic master cylinder in combination with a power operated master cylinder. The hydrostatic master cylinder has a piston working in a bore with a first pressure space between said piston and a closed end of the bore. The power operated master cylinder has a pedal-operated piston working in a bore in which there is a second pressure space. Fluid under pressure from a high pressure source can be admitted to the second pressure space through a normally closed valve which is in communication with the second pressure space and is operable upon operation of the pedal operated piston. High pressure fluid in the second pressure space can act on the piston of the hydrostatic master cylinder either directly or through a secondary piston in the bore of the power operated master cylinder. Thus the piston of the hydrostatic master cylinder is advanced in the bore of the hydrostatic master cylinder to pressurise fluid in the first pressure space and fluid from the first pressure space can be supplied to the brakes of a braking circuit of a vehicle.

3,769,802

WALKING LIFT BARGE

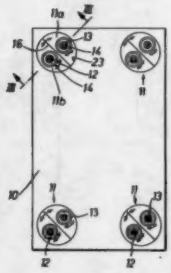
Kurt Wefer, Cologne, Dellbruck, Germany, assignor to Strabag Bau-AG, Cologne-Dentz, Germany

Filed Jan. 29, 1970, Ser. No. 6,460

Claims priority, application Germany, Jan. 31, 1969, P 19 04 726.8

Int. Cl. E02b 17/00; E02f 9/04; B65b 21/50

U.S. Cl. 61—46.5 10 Claims



A walking lift barge includes a platform having a rotatable member rotatably mounted thereon. A pair of spaced-apart substantially vertical legs extend through the rotatable member. The legs are selectively movable up and down relative to the rotatable member. With the platform supported on one leg, the rotatable member can be rotated around that one leg to move the other leg and the platform laterally.

3,769,803

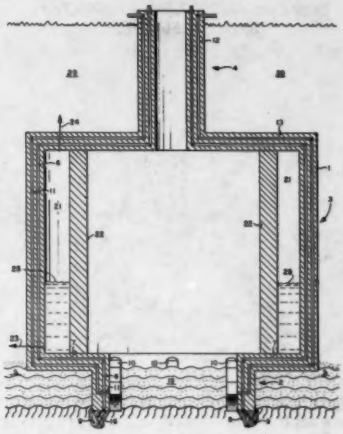
SUBMERGED STORAGE VESSEL

Herschel D. Finney, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 23, 1972, Ser. No. 228,625

Int. Cl. E02b 17/00; E02d 7/24

U.S. Cl. 61—46.5 10 Claims



A submarine storage vessel comprised of at least a lower section and an upper section, the lower section being adapted for positioning into the underwater formation to an extent such that a substantially horizontally disposed wall comprising the upper section, is positioned in contact with the formation.

3,769,804

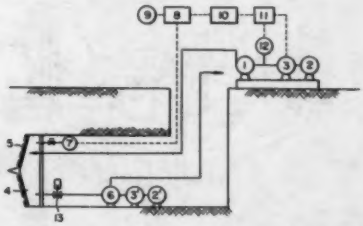
METHOD OF CONTROLLING THE WATER HEAD OF THE WORKING FACE IN THE SHIELD METHOD OF CONSTRUCTION

Hiroshi Matsushima, Tokyo, Japan, assignor to Nishimatsu Construction Company Limited, Minato-ku, Tokyo, Japan

Filed Sept. 22, 1972, Ser. No. 291,359

Int. Cl. E01g 3/02; F01d 17/08

U.S. Cl. 61—85 2 Claims



A method of controlling the water head of the working face in the pressurized-slurry sealed shield method of construction, said method of controlling the water head comprising the steps of detecting the water head of the working face with a pressure transmitter, transmitting said water head as an electric signal to a pressure regulator, comparing said electric signal with the set pressure at said regulator, converting the electric signal corresponding to the deviation between said first-named electric signal and said set pressure into a pressure signal, and transmitting said pressure signal from a controlling board as an excitation voltage to a variable-speed

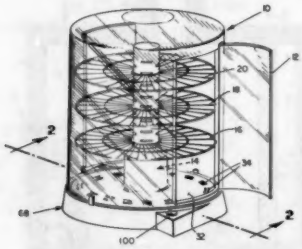
motor made up of an eddy current coupler and an induction motor to control the rotational speed of said motor, thereby changing the amount of water supplied by a pump.

3,769,805

REVOLVING DISPLAY CAPSULE

Louis J. Corini, Philadelphia, Pa., assignor to Melbro Corporation, Philadelphia, Pa.

Filed Apr. 24, 1972, Ser. No. 246,789
Int. Cl. F25b *21/02*
U.S. Cl. 62—3 **2 Claims**



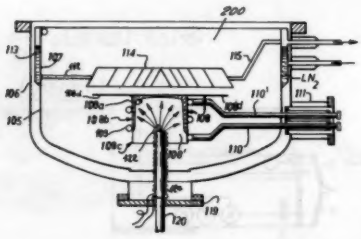
A stationary display container has a plurality of shelves mounted on a central rotor therein and doors to gain access to the shelves. The container is temperature controlled by thermoelectric means including water cooling and fan circulated air.

3,769,806

METHOD OF AND APPARATUS FOR CRYOPUMPING GAS

Jean-Claude Boissin, Montbonnot-Saint-Martin, and Jean-Jacques Thibault, Saint-Martin-D'Uriage, both of France, assignors to L'Air Liquide, Societe Anonyme Pour L'Etude et L'Exploitation des Procedes Georges Claude, Paris, France

Filed Nov. 12, 1971, Ser. No. 198,178
Claims priority, application France, Nov. 13, 1970, 7040599
Int. Cl. B01d *5/00*
U.S. Cl. 62—55.5 **12 Claims**



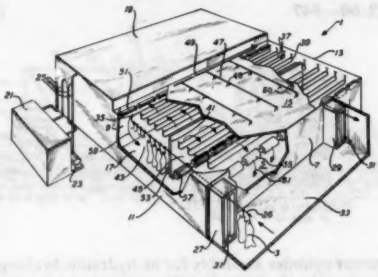
This invention relates to a method of and apparatus for pumping gas and particularly to a system in which a primary vacuum of the order of 10^{-1} to 10^{-4} Torr approximately is produced, followed by the production of a secondary vacuum. According to the invention, the main trapping surface effected in a main cryopumping operation is arranged in two areas, one being of easy access to the gas to be pumped and the other more difficult of access. A cryodeposit of the adsorbing gas is positioned practically exclusively in the area of most difficult access, in order to adsorb the residual gases. The most important residual gas referred to is helium.

3,769,807

CARCASS CHILLING FACILITY

Fred M. Foster, Anaheim, Calif., assignor to Airco, Inc., New York, N.Y.

Filed Aug. 9, 1971, Ser. No. 170,158
Int. Cl. F25d *13/06*
U.S. Cl. 62—63 **8 Claims**



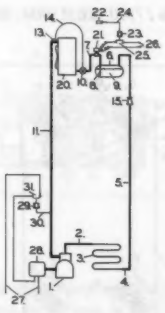
Apparatus for chilling animal carcasses, including an insulated enclosure having a baffled entrance and exit, and means to inject carbon dioxide refrigerant into the enclosure. A continuous variable speed conveyor is mounted in the enclosure for transporting the carcasses therethrough. The conveyor is arranged in serpentine fashion to define a plurality of parallel, closely spaced, inter-connected flights within the enclosure. Elongated line-flow fan means are positioned to establish a recirculating flow of carbon dioxide vapor across the closely spaced flights. An adjustable temperature controller in conjunction with a temperature sensor controls temperature in the enclosure by means of signals to the carbon dioxide injecting apparatus.

3,769,808

REFRIGERATION SYSTEMS WITH ELEVATED RECEIVERS

Daniel E. Kramer, 2009 Woodland Dr., Yardley, Pa.

Filed Jan. 24, 1972, Ser. No. 219,980
Int. Cl. F25b *39/04*
U.S. Cl. 62—115 **4 Claims**



In air cooled refrigeration systems of the compression type which may operate in low ambients with no or minimum condenser capacity control, it is sometimes required to locate the evaporator high above the condensing unit. Especially under winter conditions, it is likely that liquid refrigerant leaving the condensing unit will suffer sufficient pressure loss by gravity in traversing the vertical upflow riser, that its flash point will be reached. Then the formerly clear liquid column will flash into

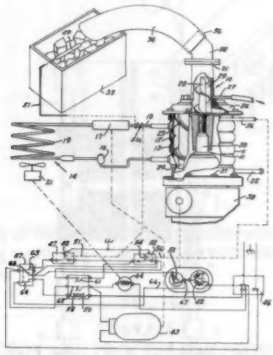
a mixture of vapor and liquid. Most expansion devices are designed to function correctly with vapor-free liquid entering their orifices.

3,769,809

CONTROL APPARATUS FOR AN ICE MAKER

James M. Robinson, White Bear Lake, and John B. Lyman, Bloomington, both of Minn., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed May 20, 1971, Ser. No. 145,130
Int. Cl. F25c *1/14*
U.S. Cl. 62—137 13 Claims



An ice maker of the type comprising a freezing cylinder with the coils of an evaporator disposed circumjacent thereto, an auger rotatable within the freezing cylinder and a bin for receiving and storing an ice product produced by the ice maker has a control apparatus adapted to control the operation of an auger motor rotating the auger so that the auger motor operates whenever the accumulation of ice within the storage bin is below a preselected level and the temperature of a compressor suction line connected to the evaporator is above a first preselected value and discontinuing the operation of the auger motor whenever either the accumulation of ice within the bin is above the preselected level or the temperature of the compressor suction line at a point adjacent to a compressor is below a second preselected value less than the first preselected value. In that manner, the production of ice is regulated in accordance with the demand for ice and is discontinued in the event of excessive flood back to the compressor. The control apparatus also discontinues operation of the compressor in the event the auger motor becomes overloaded, and a clean cycle switch enables operation of the auger motor without simultaneously operating the compressor to facilitate cleaning operations.

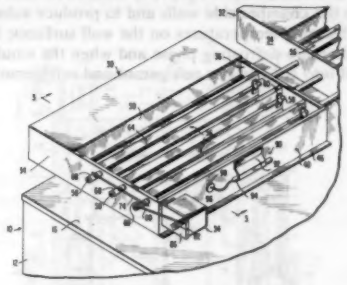
3,769,810

FIELD INSTALLED LOW AMBIENT DAMPER FOR OUTDOOR ROOFTOP CONDENSER INSTALLATION

Richard J. Swartwout, Penn Laird, Va., assignor to Dunham-Bush, Incorporated, Harrisonburg, Va.

Filed Aug. 28, 1972, Ser. No. 284,001
Int. Cl. F25b *39/04*
U.S. Cl. 62—183 7 Claims

A temperature responsive, adjustable louver damper box overlies the hot air discharge opening in the top of a standard rectangular condenser housing exposed to outside air with the forward portion of the box overhanging the front of the condenser housing. Louvers in closed position recirculate at least a part of the hot condenser discharge air through the box for discharge in front of the intake opening of the condenser housing.

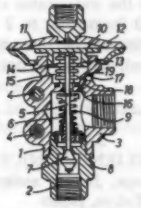


3,769,811

REFRIGERANT VALVE

Hans Jorgen Jespersen, Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed June 2, 1972, Ser. No. 259,118
Claims priority, application Germany, June 8, 1971, P 21 28 416.2
Int. Cl. F25b *41/04*
U.S. Cl. 62—224 3 Claims



The invention relates to a refrigerant valve assembly of the type in which the actuating spindle is loaded at one of its ends by a membrane pressure element and the other end by a spring. The membrane end of the spindle is surrounded by a bellows and it is the chamber which surrounds the bellows in which the interest is. That chamber is substantially sealed from the atmosphere but a first fluid passage connects it with the atmosphere. A second fluid passage which has fluid communication with the downstream side of the valve has a Venturi insert and intersects the first fluid passage. The Venturi produces an aspirating effect which draws moisture ladened air out of the bellows chamber referred to above.

3,769,812

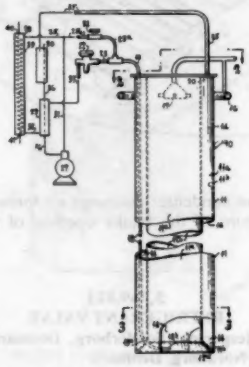
COMPRESSOR LUBRICATION APPARATUS FOR CLOSED REVERSIBLE CYCLE ICE-MAKING SYSTEMS

Robert W. Gordon, P.O. Box 606, Longwood, Fla.

Filed May 26, 1972, Ser. No. 257,299
Int. Cl. F25c *1/12*; F25b *43/02*
U.S. Cl. 62—352 1 Claim

Apparatus for concurrently circulating a refrigerant and a refrigerant oil through a closed reversible cycle ice-making system having interconnected compressor, condenser and evaporator components and in a manner which provides efficient heat exchange, capacity and compressor lubrication. The invention is characterized by a combination of three in-

terdependent features, namely, (1) During the ice-forming phase, an emulsion of a refrigerant and a refrigerant oil is caused to flow through the evaporator chamber at sufficient velocity and turbulence to prevent substantial adherence of the oil to the chamber side walls and to produce substantially uniform freezing temperatures on the wall surfaces; (2) During the alternate defrosting phase and when the emulsion has separated into hot gaseous refrigerant and refrigerant oil, the



gaseous refrigerant is caused to flow through the chamber at sufficient velocity to suspend the oil and sweep it from the chamber walls, and (3) During both of said phases, a positive pressure drop across the evaporator chamber is maintained within the range of 0 lbs./sq. in. to 2 lbs./sq. in. to thereby create a balanced efficiency between oil circulation and heat exchanger on one hand, and the capacity of the system on the other.

3,769,813

RESILIENT TORQUE BAR

Shiro Okada, Ashikaga, Japan, assignor to Fuji Jyukogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 22, 1972, Ser. No. 255,362
Int. Cl. F16c *1/06*
U.S. Cl. 64—2 R **5 Claims**

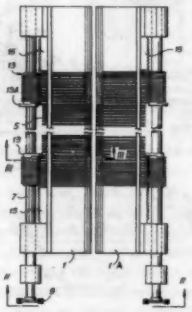
A resilient torque bar of a construction such that, around a core axle of resilient substance, a plurality of layers of fiber cloth or metal wire net and a plurality of rubber layers are alternately wound in the left and right directions, or on the bias, and the whole combination is protected by an outer covering from any external damage.

3,769,814

DEVICE FOR AUTOMATIC AND PROGRAMMED INSERTION OF NEEDLES INTO WORK IN RECTILINEAR HOSIERY MACHINES

Angiolo Pieracci, Staffoli, Pisa, and Alfredo Giachetti, Lastra A Signa, Firenze, both of Italy, assignors to Billi S.p.A., Firenze, Italy

Filed Jan. 27, 1972, Ser. No. 221,197
Int. Cl. D04b *7/10*
U.S. Cl. 66—76 R **5 Claims**



Apparatus for use on a straight independent needle knitting machine to progressively add needles from a spaced pair of inactive non-knitting series thereof to each end of an active knitting series of needles thereby to increase the number of needles in the active knitting series of needles. The knitting machine has a lengthwise extending needle bed with a plurality of equally spaced parallel needle slots extending crosswise thereof. A needle and an associated jack are individually disposed in each of a series of the slots, the jacks being individually movable from a first to a second position thereby to individually move their associated needles from inactive to active position. A portion of each of the jacks in their first position extends from the needle slots at one side of the needle bed, the jack extensions being in engagement with a spiral groove peripherally formed on a sleeve which encircles a rotatable shaft disposed in spaced parallel rotation to the needle bed. The sleeve rotates with the shaft and moves axially thereof by reason of the jack engagement therewith, the sleeve being provided with a radially extending cam to progressively engage and move successive jacks and their needles during intermittently pattern controlled turns of the shaft.

3,769,815

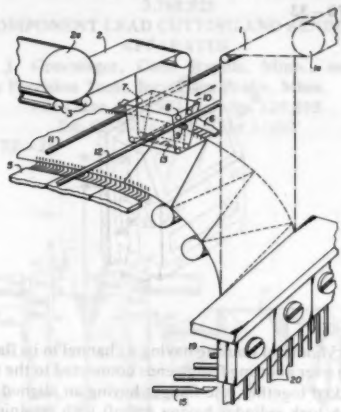
METHOD OF PRODUCING TEXTILES ON KNITTING MACHINES

Siegfried Ploch; Walter Scholtis; Heini Gerischer; Heinz Zschunee, and Karl-Heinz Dietrich, all of Karl-Marx-Stadt, Germany, assignors to Forschungsinstitut fur Textiltechnologie, Karl-Marx-Stadt, Germany

Filed Dec. 14, 1970, Ser. No. 97,823
Int. Cl. D04b *23/10, 23/08*
U.S. Cl. 66—85 A **10 Claims**

A method of producing a textile fabric on a multi-needle stitching machine comprising the steps of feeding at least one

film comprised of a synthetic polymer into said stitching machine, actuating said machine, whereby said film is split

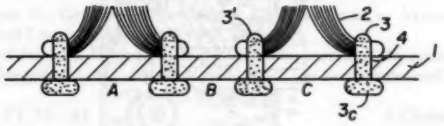


into a plurality of film elements and simultaneously integrated in the ongoing textile manufacture, and collecting said manufactured textile.

3,769,816
CORDUROY AND PROCESS FOR PRODUCING CORDUROY

Siegfried Ploch; Peter Zeisberg; Heini Gerischer, all of Karl-Marx-Stadt; Siegfried Hennig, Neugersdorf; Manfred Linack, Eibau, and Kurt Klinger, Leutersdorf, all of Germany, assignors to Forschungsinstitut fur Textiltechnologie, Karl-Marx-Stadt, Postschlressfach, Germany

Filed Dec. 16, 1971, Ser. No. 209,662
Int. Cl. D04b *23/08*
U.S. Cl. 66—193 **9 Claims**



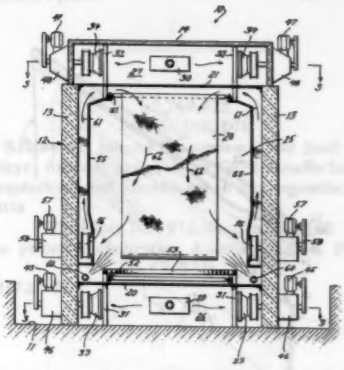
Corduroy or the like, wherein the pile tufts are arranged on a base web and are doubly bound into chain-stitch seams, each one of the two free legs of the pile tufts are bound to the base web by a respective wale of the chain-stitch seam, and the foot portion of each pile tuft, interconnecting the two free legs thereof, is arranged in the direction of the chain-stitch seam.

3,769,817
TEXTILE TREATMENT APPARATUS

William F. Roach, Hurffville, N.J., assignor to Kingsley Dryer Corporation, Hurffville, N.J.

Filed Dec. 27, 1971, Ser. No. 212,086
Int. Cl. D06c *1/06*
U.S. Cl. 68—5 D **5 Claims**

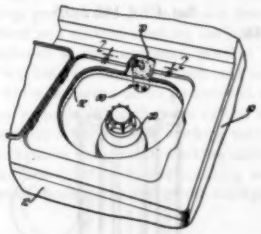
Apparatus for treating textiles with steam and the like wherein a chamber is provided for passing textile material during treatment, the lower and upper walls of the chamber being heat conductive for transferring heat into the chamber, a steam dispenser for introducing the steam into the chamber, and means for heating the chamber walls to prevent condensation of steam on the walls.



3,769,818
LINT FILTER FOR WASHING MACHINE

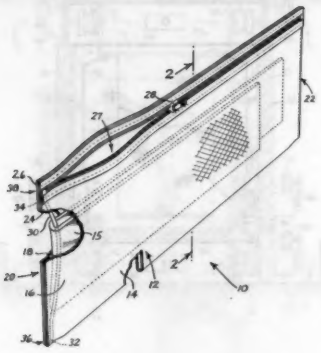
Roy R. Smith, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed July 14, 1972, Ser. No. 271,784
Int. Cl. D06f *39/10*
U.S. Cl. 68—18 F **4 Claims**



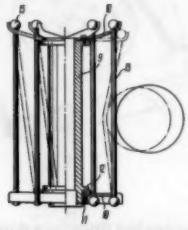
A self-compacting lint filter for a domestic clothes washer is connected in a recirculating liquid system adjacent the access opening of the washer for ready detachment of the filter from the washer for manual cleaning thereof. The filter has a rotatable nozzle in a mesh bag. The nozzle rotates in response to the recirculation of liquid and sprays liquid through the bag to collect lint on the inside thereof. As the nozzle rotates, the collected lint is flushed downwardly by the circling spray toward the bottom of the bag, thereby to self-clean collected lint from the sidewall of the bag during recirculation while compacting said lint into an easily manually removable wad at the bottom of the bag when the filter is detached for cleaning thereof.

3,769,819
LAUNDERING BAG
Alberta L. Contreras, 216 E. 10th, McMinnville, Oreg.
Filed June 21, 1972, Ser. No. 264,744
Int. Cl. D06f 7/00, 35/00
U.S. Cl. 68—213 9 Claims



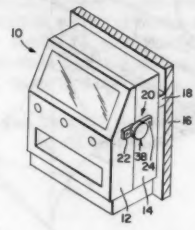
An improved mesh fabric laundering bag having an article-retaining element within the bag for retaining an article substantially in a predetermined position during laundering. The element may consist of an elastic cord having its opposite ends attached to adjacent corners within the bag.

3,769,820
PELT FLESHING MACHINE
Jury Vasilievich Pavlov, Ramensky raion, Rodniki, Trudovaya ulitsa, kv. 12; Alexandr Alexeevich Petrov, Ramensky raion, Rodniki, ulitsa B. Uchitelskaya, 9, kv. 55; Viktor Alexandrovich Nikolsky, ulitsa Fabrichnaya, 21, kv. 12; Raisa Ivanovna Chunyaeva, Ljuberetsky raion, poselok Malakhovka, ulitsa Schorsa, kv. 21, all of Moskovskaya oblasti, U.S.S.R., and Leonid Alexandrovich Filin, deceased, late of Zheleznodorozhnaya, 25, kv. 39, Moskovskaya oblasti, U.S.S.R. (by Svetlana Ivanovna Bulaeva, administratrix)
Filed Feb. 24, 1972, Ser. No. 228,925
Claims priority, application U.S.S.R., Mar. 2, 1971, 1622318
Int. Cl. C14b 1/36
U.S. Cl. 69—46 3 Claims



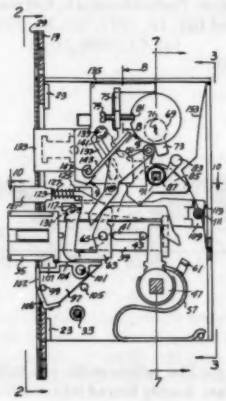
A pelt fleshing machine used in preliminary processing of peltries in which there is provided a skin holder, a carriage moving over frame guides along the holder, and a cutting tool connected with an electric motor mounted on the carriage. The cutting tool is defined by two discs located on a spindle and provided with strings or flexible elements. The strings are longitudinally spring-loaded at one end, with one of the discs being installed on the spindle with a provision for turning with relation to the other disc, and locked against movement along the spindle.

3,769,821
LOCK DEVICE FOR SECURING APERTURED MEMBERS
Mortimer A. Randel, 21 Primrose Lane, Valley Stream, N.Y.
Filed Apr. 17, 1972, Ser. No. 244,465
Int. Cl. E05b 67/36, 67/38
U.S. Cl. 70—33 4 Claims



A flat cylindrical housing having a channel in its flat surface for fitting over abutting flange ends connected to the members to be locked together, the flanges having an aligned aperture therein. A lock cylinder having a shaft with retaining means thereon is situated in a passageway through the housing transverse to the channel. The shaft fits within the aperture and the retaining means, under control of a key, holds the housing onto the flange ends.

3,769,822
DOOR LOCK
Leon Yulkowski, Pontiac, Mich., assignor to General Lock Company, Pontiac, Mich.
Filed June 12, 1972, Ser. No. 261,586
Int. Cl. E05b 59/00, 55/00
U.S. Cl. 70—107 13 Claims



In a door lock which has a casing, a face plate, a lock cylinder with rotatable cam, a spring-biased retractible latch bolt, and inner and outer manually rotatable hubs with the inner hub in operative engagement with said latch bolt for retracting the same, the improvement which includes a clutch pivoted upon the latch bolt and normally spring-biased to a position disengaged from the outer hub. An upper transmission bar is pivotally mounted within the casing adapted for operative engagement with a lower transmission bar pivoted within the casing with the latter in operative engagement with the clutch. The upper transmission bar is normally positioned in the path of rotation of the cylinder cam so that when engaged thereby acting through the lower transmission bar and

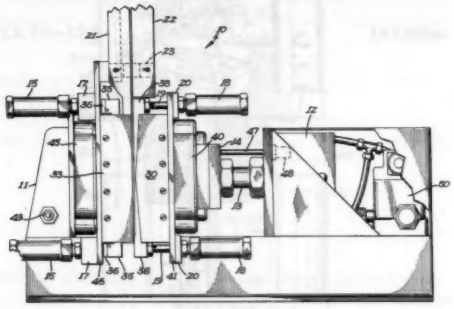
the clutch is adapted to retract the latch bolt, and is also adapted to rotate the clutch for operative engagement by the outer hub.

3,769,823

COMPONENT LEAD CUTTING AND BENDING APPARATUS

Marvin J. Greeninger, Coon Rapids, Minn., assignor to Lectro Precision Tools, Inc., Eden Praire, Minn.

Filed Mar. 31, 1971, Ser. No. 129,895
Int. Cl. B21j *3/26;* **B21d** *31/00*
U.S. Cl. 72—24 **5 Claims**



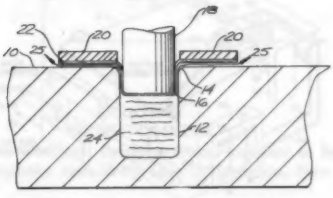
A device for rapidly cutting and bending the leads of an electronic component so that the component is ready for placement on a printed circuit board. The apparatus includes a moveable blade and a stationary blade for cutting, the moveable blade alone for bending, and a component holder which is capable of holding a plurality of components. After the leads of the components have been cut and bent, an ejector system provides ample space for the components to be removed by striking the bent leads with an ejector bar after having moved the component holder away from the components to provide space so that the components are able to fall to a tray at the bottom after having been removed from a center block about which the leads had been formed by the action of the ejector bar.

3,769,824

DEEP DRAWING METHOD

Wayne G. Granzow, Middletown, Ohio, assignor to Armco Steel Corporation, Middletown, Ohio

Filed June 14, 1972, Ser. No. 262,676The portion of the term of this patent subsequent to Nov. 6, 1990, has been disclaimed.
Int. Cl. B21d *22/22*
U.S. Cl. 72—41 **5 Claims**



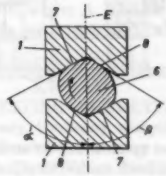
Method for deep drawing metallic articles from sheet material utilizing a die plate having a female cavity, a hold-down member for holding sheet material against the die plate around the cavity, and a male die punch for drawing the sheet material into the female cavity. Prior to placing the sheet material over the female cavity, the cavity is substantially filled with a liquid lubricant. The hold-down acts to hold the sheet material against the die plate so as to prevent wrinkling during drawing in a conventional manner, and the male die draws the sheet material into the liquid filled cavity forcing the liquid lubricant between the under surface of the sheet material and the die plate.

3,769,825

SWAGING DIE

Bruno Kralowetz; Johann Braunwieser, and Josef Reznar, all of Steyr, Austria, assignors to GFM Gesellschaft fur Fertigungstechnik und Maschinenbau Aktiengesellschaft, Steyr, Austria

Filed July 10, 1972, Ser. No. 270,105
Claims priority, application Austria, Aug. 4, 1971, 6805
Int. Cl. B21j *13/02*
U.S. Cl. 72—76 **1 Claim**



The die is used to produce cylindrical stock in a swaging machine which comprises only two hammers adapted to blow one against the other and in which a workpiece is rotated about its axis and axially fed between said hammers at the same time. Each of said hammers carries one of said dies for engaging said workpiece. The die is formed with a groove having the configuration of an obtuse-angled V. The groove has first and second side faces, which respectively form first and second working surfaces engageable with said workpiece. The groove has a prismatic finishing portion and an entrance portion which axially precedes and tapers in the shape of a wedge to said finishing portion. A plane which bisects the angle between said first and second working surfaces in said finishing portion includes in said entrance portion a larger angle with said first working surface than with said second working surface. Each die is mounted on its hammer in such a manner that the groove extends along the axis of the workpiece, the first working surface is the leading working surface relative to the rotating workpiece, the second working surface is the trailing working surface relative to the rotating workpiece, and said plane extends through the axis of the workpiece.

3,769,826

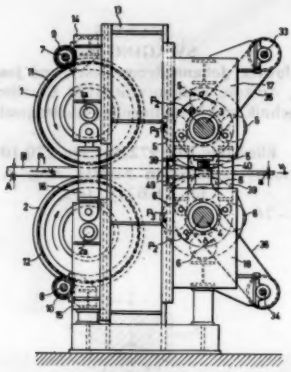
APPARATUS FOR ROLLING METAL STRIP

Wilhelm Friedrich Lauener, Rikon, Switzerland, assignor to W. F. Lauener A G, Rikon, Switzerland

Filed May 4, 1972, Ser. No. 250,343
Claims priority, application Switzerland, May 6, 1971, 6693/71
Int. Cl. B21b *21/00, 35/00*
U.S. Cl. 72—191 **1 Claim**

Tne disclosed apparatus for rolling metal strip comprises a driven rotary roller system on both sides of the strip to be worked. Each roller system comprises a mainshaft and at least two rollers rotatably mounted on this mainshaft parallel to the

latter and rotatable from a special drive through the agency of friction clutches. The rollers in each system are uniformly distributed around the respective mainshaft and at the same radial distance from the latter. The mainshafts and roller systems are synchronously driven in relatively opposite directions, and



the rollers in the two systems are so arranged that they meet the strip in pairs, one from each system, on the two sides of the strip. The strip is fed between the two roller systems by two driven feed rollers having a weight sufficient to absorb vibrations which are set up in the metal strip by the action of the roller systems.

3,769,827

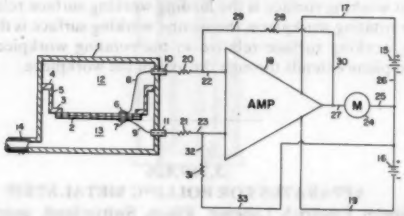
INSTRUMENT SENSOR FOR ELECTRICALLY MEASURING PRESSURE CHANGES

Alvin G. Moore, Cumberland, Md., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 29,208, April 16, 1970, Pat. No. 3,667,293. This application Nov. 3, 1971, Ser. No. 195,516

Int. Cl. G01l 9/08; G01c 21/00

U.S. Cl. 73—398 R **7 Claims**



An instrument for electrically measuring pressure changes having a circular bimorph and a thin flexure comprising iron-nickel alloy supporting the circular bimorph at its circumference and said flexure having its outer extremity adapted to support said bimorph in a pressure cell comprising iron-nickel-alloy, whereby a high electrical output is obtained from the said bimorph in response to pressure being applied thereto.

3,769,828

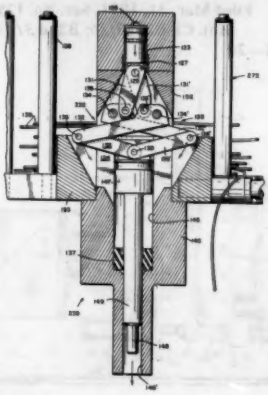
MANUFACTURING OF COMPOSITE MATERIALS

William M. B. Fitzgerald, Toronto, Ontario, Canada, assignor to Johnson Mathey and Mallory, Ltd., Toronto, Canada

Division of Ser. No. 786,971, Dec. 26, 1968, Pat. No. 3,634,934. This application Nov. 25, 1971, Ser. No. 92,890

Int. Cl. B21j 7/24

U.S. Cl. 72—450 **1 Claim**



A welded composite formed by cutting and heating continuous lengths of wire and immediately transferring the lengths to a die where the lengths are joined by pressing at high pressure and the joined lengths are then forced at least a portion of the way out of the die where heading operations are performed.

ERRATUM

For Class 73—398 R see:
Patent No. 3,769,827

3,769,829

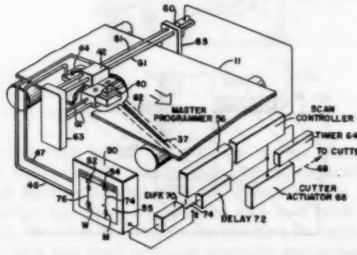
WEB SAMPLING METHOD AND APPARATUS

John W. Fleming, Jr., 1556 B Fowler Dr., Columbus, Ohio, and James Michael McMullen, 2484 Wimbledon Rd., Columbus, Ohio

Continuation of Ser. No. 870,795, July 24, 1969, which is a division of Ser. No. 601,750, Dec. 14, 1966, abandoned. This application June 12, 1972, Ser. No. 262,032

Int. Cl. G01d 9/38

U.S. Cl. 73—1 R **15 Claims**



A system and method for calibrating an apparatus for measuring a property of moving sheet material. A movable cutter is provided so that a sample of the moving sheet may be removed at the same time the sheet property is measured and recorded by normal means. The sample and measure-

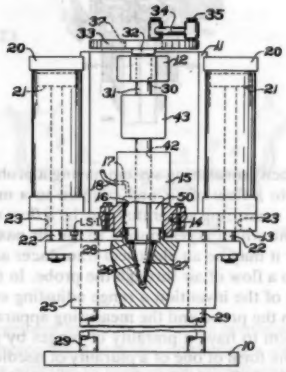
ments are correlated so that independent tests on the sample can be compared to the original measurements.

3,769,830

VISCUROMETER

John P. Porter, Cuyahoga Falls, and Paul W. Karper, Stow, both of Ohio, assignors to The B. F. Goodrich Company, New York, N.Y.

Filed Sept. 1, 1972, Ser. No. 285,742
Int. Cl. G01n *3/32*
U.S. Cl. 73—15.6 14 Claims



A method and apparatus for determining the physical properties of vulcanizable elastomeric materials utilizing a cone-shaped oscillating rotor that is cooperative with a cone-shaped cavity in a stationary mold section whereby a sample of material is confined therebetween and subjected to a confining pressure, as well as an oscillating shearing force. The walls of the test chamber are heated to a predetermined temperature during cure, while torque sensing means are connected to the input of the rotor to measure the variation in force required to oscillate such projection. Means are provided to maintain a programmed confined pressure which is proportional to torque developed on the sample during the cure cycle compensating for any shrinkage of the sample. A recorder is connected to the torque sensing device to record the variations in shearing strain.

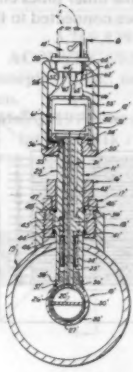
3,769,831

DENSITOMETER

Gerald Lance Schiatter, Boulder, Colo., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Oct. 13, 1971, Ser. No. 188,888
Int. Cl. G01n *9/00*
U.S. Cl. 73—32 6 Claims

A vibration densitometer having means for producing an output signal which is a pulse train of a pulse repetition frequency that is the function of the density of a fluid in which a densitometer probe is immersed. The densitometer has a linearization circuit which is exceptionally accurate for both liquid and gas density measurement or the like, the linearization circuit producing an output voltage E_{∞} given by the equation $E_{\infty} = AT^2 + CT + B$, where A, B and C are constants, and T is the reciprocal of the pulse repetition frequency.

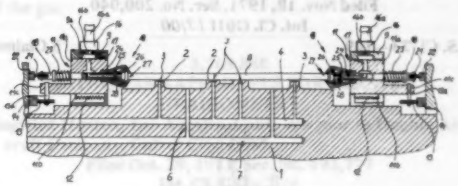


3,769,832

APPARATUS FOR TESTING CIGARETTES OR THE LIKE

Anton Baier, Ahrensburg, Germany, assignor to Hauni-Werke Korber & Co. KG, Hamburg, Germany

Filed Sept. 27, 1972, Ser. No. 292,632
Claims priority, application Germany, Oct. 8, 1971, P 21 50 186.0
Int. Cl. G01m *3/04*
U.S. Cl. 73—41 12 Claims



A pneumatic cigarette testing apparatus wherein the drum which moves cigarettes sideways past a testing station carries one or two annuli of sealing devices having holders which are movable toward and away from the adjacent ends of cigarettes. Each holder supports an elastic annular sealing element whose internal diameter is normally less than the diameter of a cigarette wrapper but can be enlarged in response to axial movement of a deforming plunger in the respective holder. The sealing elements are expanded upstream of the testing station and the respective holders are thereupon moved axially so that the expanded sealing elements surround with some clearance the adjacent ends of aligned cigarette wrappers. The plungers allow the sealing elements to contract and to sealingly engage the ends of wrappers during travel past the testing station.

3,769,833

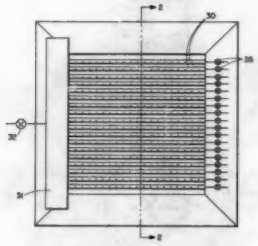
BUBBLE GENERATOR

Donald E. Ordway, Freeville, and Richard W. Hale, Ithaca, both of N.Y., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 30, 1972, Ser. No. 257,787
Int. Cl. G01m *9/00*
U.S. Cl. 73—147 2 Claims

A device for the rapid generation of massive quantities of gas-filled, neutrally buoyant bubbles is provided. The device

consists of a plurality of parallel struts each streamlined like an airfoil and containing a gas manifold and a bubble film material (BFM) manifold. The generating elements comprise two concentric tubes with the inner tubes connected to the gas manifold and the outer tubes connected to the BFM manifold.



The struts are disposed near the discharge end of a cylindrical housing through which an axial air flow is created by a motor and fan plus screens and flow straighteners. The bubbles are pulled off the tips of the outer tubes by the air flow, with the size of the bubbles governed principally by the velocity of the air flow.

3,769,834

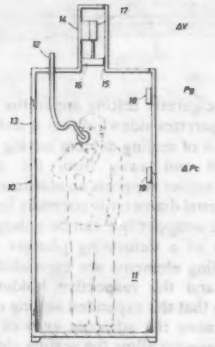
WHOLE BODY MEASUREMENT SYSTEMS

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention by, and John S. Ogle, Milpitas, Calif.

Filed Nov. 18, 1971, Ser. No. 200,040

Int. Cl. G01f *17/00*

U.S. Cl. 73—149 **5 Claims**



A system for measuring the volume and volume variations of a human body under zero gravity conditions is disclosed. An enclosed chamber having a defined volume and arranged for receiving a human body is provided with means for infrasonically varying the volume of the chamber. The changes in volume produce resultant changes in pressure, and under substantially isentropic conditions, an isentropic relationship permits a determination of gas volume which, in turn, when related to total chamber volume permits a determination of the body volume. By comparison techniques, volume changes of a human independent of gravity conditions can be determined.

3,769,835

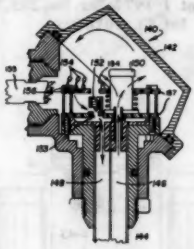
PITOT CALIBRATED AIR VELOCITY MEASURING SYSTEM WITH TRANSDUCER

Alfred A. Obermaier, Barrington, and Martin J. Pierman, Mount Prospect, all of Ill., assignors to Alnor Instrument Company, Div. of Illinois Testing Laboratories, Inc., Chicago, Ill.

Division of Ser. No. 687,084, Nov. 13, 1967, abandoned. This application Oct. 6, 1970, Ser. No. 78,563

Int. Cl. G01f *5/00*

U.S. Cl. 73—202 **14 Claims**



An air velocity measuring system having a probe adapted to be placed into a flow of air and coupled to a measuring apparatus. The measuring apparatus may be a flow meter having a moving vane which is responsive to the air passing through the probe or it may be an electrical transducer adapted to be responsive to a flow of air through the probe. In the preferred embodiment of the invention a range adjusting switch is coupled between the probe and the measuring apparatus and enables the system to have a plurality of ranges by placing a resistance, in the form of one of a plurality of needle valves, into the path of the air flow to the measuring apparatus. The probe is a conduit having means for adjusting the quantity of air flowing to the measuring apparatus. In the preferred embodiment, the probe, the range adjusting switch, and the measuring apparatus are calibrated as a system. Once calibrated, the individual elements of the system are interchangeable with the corresponding elements of another of similarly calibrated mass produced systems without requiring subsequent recalibration of each system. The means for adjusting the quantity of air flowing to the measuring device are adjustable during the calibration of the probes individually or as part of the air velocity measuring system.

3,769,836

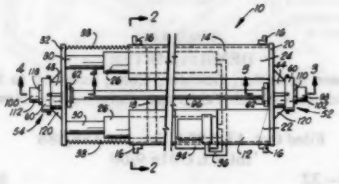
APPARATUS FOR STRAIGHTENING, UNTWISTING AND TESTING TUBULAR ELEMENTS

Everett A. Heldenbrand, Odessa, Tex., assignor to Heldies Portable Pipe Service, Inc., Odessa, Tex.

Filed Mar. 9, 1972, Ser. No. 233,204

Int. Cl. B21d *11/02*

U.S. Cl. 72—302 **9 Claims**



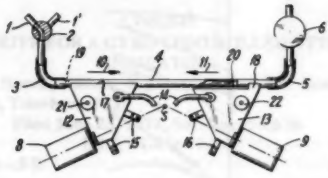
An improved apparatus for straightening, untwisting, testing and strengthening sucker rods and tubular elements such as oil well drill pipe, tubing and the like, comprising an extendable

frame having opposite ends with a rotary supporting head mounted on each end thereof and adapted to support the respective opposite ends of a tubular element to be straightened. Extendable power cylinders are provided for moving the rotary supporting heads apart thereby stretching, straightening, untwisting and testing deformed sucker rods and tubular elements.

3,769,837
ARRANGEMENT FOR DETERMINING THE CONSTITUENTS OF A GAS MIXTURE

Thaddaus Kraus, Vaduz; Gerold Paesold, Balzers, both of Liechtenstein, and Elmar Metzler, Feldkirch, Austria, assignors to Balzers Patent und Beteiligungs Aktiengesellschaft, Balzers, Liechtenstein

Filed June 3, 1971, Ser. No. 149,711
Claims priority, application Switzerland, June 4, 1970, 8418/70
Int. Cl. G01n *31/06*
U.S. Cl. 73—23 **12 Claims**

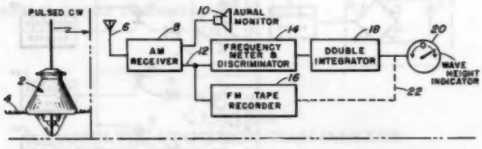


In an arrangement for checking on the constituents of a gas mixture, a passageway is provided containing a sorption agent for combining with one or more of the constituents of the mixture so that the remaining portion can be passed through a gas detector. The passageway, which is preferably tubular, is arranged to be heated and cooled for providing it with a heated zone and a separate cooled zone. Vibrators are connected to the passageway for displacing the sorption agent between the heated zone and the cooled zone whereby after certain gas constituents are removed from the gas mixture, the sorption agent can be regenerated by heating it in the heated zone and driving off the previously combined gas constituents which are then removed from the passageway.

3,769,838
WAVE MEASURING APPARATUS

Lawrence A. Buckler, Nova Scotia, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence

Filed Nov. 18, 1971, Ser. No. 199,951
Claims priority, application Canada, Jan. 29, 1971, 104,004
Int. Cl. G01p *5/00*
U.S. Cl. 73—170 A **10 Claims**

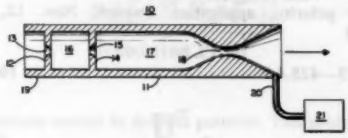


Wave measuring apparatus for determining the wave height on the surface of the sea, including a buoy having an antenna whereby when floating on the sea its motion causes electronic circuitry within it to transmit bursts of RF signals, the pulse repetition rate varying directly in proportion to the acceleration applied to the buoy as it moves up and down on the surface of the sea in which it is located. Ship-borne apparatus is provided to receive the signals transmitted by the wave buoy to analyze them and to provide an indication of the height of the waves of the sea in which the buoy is located.

3,769,839
ACOUSTIC SENSOR

Gary L. Innes, Hennepin, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 3, 1971, Ser. No. 139,452
Int. Cl. G01k *11/26*
U.S. Cl. 73—339 A **4 Claims**

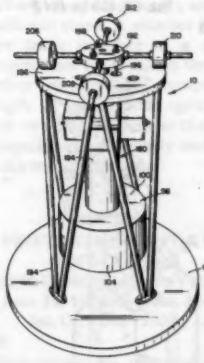


An acoustic oscillator adapted for use as a gas temperature sensor wherein a fluidic signal whose frequency is indicative of the temperature of the gas is generated by a hole-tone resonator. A housing member has first and second axially aligned orifices separated by an enclosed control volume. A jet passing through the orifices sets up oscillations which are reinforced by resonance of the control volume. The oscillations are further reinforced and stabilized by a second downstream chamber, which in the preferred embodiment is a half wavelength resonator. The half wavelength resonator terminates in a converging-diverging nozzle which promotes choked flow in the exhausting fluid, thereby making the sensor insensitive to variations in input pressure. The frequency of the oscillations thus produced is indicative of the temperature of the gas.

3,769,840
METHOD AND APPARATUS FOR GRAVITY GRADIOMETRY

Siegfried Hansen, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Oct. 29, 1971, Ser. No. 193,777
Int. Cl. G01v *7/16*
U.S. Cl. 73—382 **25 Claims**



Gravity gradiometry measurements are accomplished by mounting two sensitive local gravity sensors on a stiff bending beam and feeding back signals to bend the beam, in accordance with local gravity vector signals. The sensitive axes of the several local gravity sensors are directed in generally

the same direction. The bending beam and the sensors mounted thereon are supported in a pendulous structure which has a plane isolated from local accelerations in the plane. The bending beam, with its sensors, is mounted in that plane so that they are isolated and sense only gravity gradients.

3,769,841

DEVICE FOR AUTOMATIC SAMPLING AND MEASUREMENT OF LIQUID VOLUMES

Sigvard Thulin, Taby, Sweden, assignor to AGA Aktiebolag, Lidingo, Sweden

Filed Nov. 4, 1971, Ser. No. 195,758

Claims priority, application Sweden, Nov. 12, 1970, 15298/70

Int. Cl. B01l *3/02*

U.S. Cl. 73—425.4 P **10 Claims**

Automatic sampling and measurement device for liquid volumes in which the orifice of a tube is submersible in the liquid to be sampled, there being above the liquid surface an appropriate overpressure in relation to the pressure at the other end of the tube, there being further placed a detector at a defined level of the tube, the volume in the tube between its orifice submersible in the liquid and said level corresponding to the liquid volume to be sampled, the detector being caused to activate a device which raises the tube orifice out of the liquid, when the interface between liquid and gas in the tube reaches said level, after which the overpressure forces the so measured liquid volume out through the other end of the tube.

3,769,842

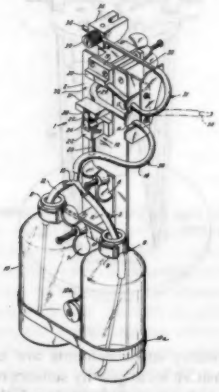
SUBMERSIBLE SAMPLER

Joseph Kahl, 8049 Prospect Way, La Mesa, Calif.

Filed Jan. 5, 1972, Ser. No. 215,516

Int. Cl. G01n *1/12*

U.S. Cl. 73—425.6 **7 Claims**



One or more receptacles are mounted on a frame so that they can be released therefrom. The receptacles are evacuated before use and are connected with a thin readily flexible hose which has sealingly received in its free end a glass tube, an exposed end portion of which is sealed so that the vacuum in the receptacles is not broken. The tube is so looped and the glass tube so held, that when the device is actuated the glass tube will be broken so as to permit aspiration of a water sample into the receptacle. A time delay device closes the flexible tube after a predetermined period of time so that the sample will not be contaiminated when the sampler is raised out of the medium in which it has been submerged.

3,769,843

STATISTICAL DESIGNED EXPERIMENTS

Lawrence R. Sperberg, 6740 Fiesta Dr., El Paso, Tex.

Continuation-in-part of Ser. No. 743,749, July 10, 1968. This application May 20, 1970, Ser. No. 38,559The portion of the term of this patent subsequent to Aug. 29, 1985, has been disclaimed.

Int. Cl. G01m *17/02*; **G01n** *19/00*

U.S. Cl. 73—432 R **14 Claims**

Method of evaluating tread wearing compositions for a vehicle tire, comprising: arranging segments of a different tread wearing compounds circumferentially about a tire body to form a continuous tread wearing surface. The tire is then subjected to a wear performance test to determine the relative performance of one of the segments as compared to another segment. The resulting accumulated data is analyzed by the use of a statistical design which characterizes the wear performace of each segment at any desired level of precision and accuracy.

3,769,844

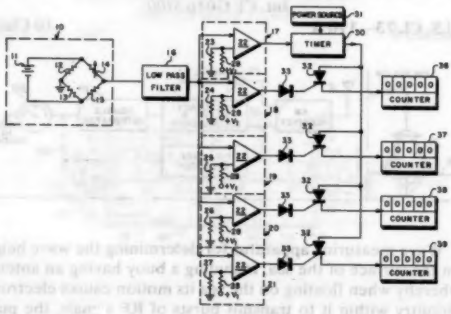
SOLID STATE ACCELERATION COUNTER

Alexander E. Skoures, Philadelphia, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 29, 1971, Ser. No. 138,516

Int. Cl. G01p *15/08*

U.S. Cl. 73—517 R **8 Claims**



An accelerometer mounted to an aircraft structure supplies an electrical signal to a low-pass filter in which all frequencies

above 2.5 Hz are attenuated. The signal from the filter is applied to a timing circuit wherein a switch is actuated if the applied signal exceeds a preset amplitude for a predetermined period of time. The output signal of the filter is also applied to a plurality of voltage comparators of various settings in which respective output signals are generated if the filter output signal exceeds various predetermined setpoints. The coincidence of outputs from the timing circuit and an individual voltage comparator pulses a counter associated with the comparator and advances the counter one unit to record the fact that a load factor level above a predetermined magnitude has been experienced by the aircraft.

ERRATUM

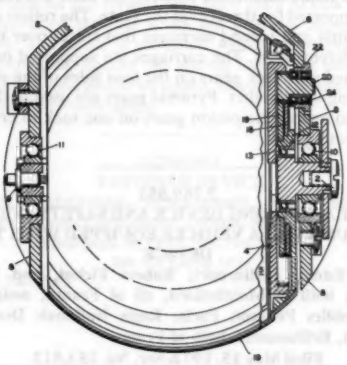
For Class 73—202 see:
Patent No. 3,769,835

3,769,845

GEAR DRIVE FOR A GYRO CONTROLLED ATTITUDE INDICATOR

Stanley J. Nocek, Clifton, N.J., assignor to The Bendix Corporation, Teterboro, N.J.

Filed June 25, 1971, Ser. No. 156,636
Int. Cl. G01c *19/16*
U.S. Cl. 74—5 R **3 Claims**



A gyro indicating instrument includes an indicating sphere geared to a gyro through a planetary gear arrangement for being displaced in accordance with the pitch attitude of an aircraft. The gear arrangement includes external backlash adjustment means for eliminating sphere jitter.

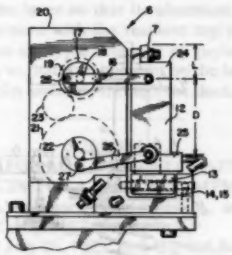
3,769,846

MULTIPLE POSITION SEAM INDEXER

Anton A. Aschberger, Oak Lawn, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Division of Ser. No. 848,808, Aug. 11, 1969, Pat. No. 3,617,679. This application May 13, 1971, Ser. No. 142,958
Int. Cl. F16h *21/00*
U.S. Cl. 74—23 **5 Claims**

An indexer for turning a can on which the seam has not been fully welded so that the welding current goes through two or three positions on the surface of the electrode as successive can seams are turned to these positions by the indexer.



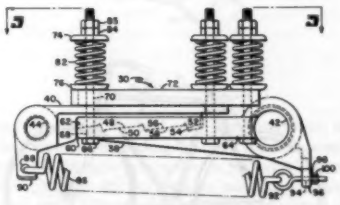
The electrode erodes in definite patterns. This prolongs electrode life.

3,769,847

BREAKAWAY MECHANICAL LINKAGE

Paul A. Luthman, Maria Stein, and Thomas R. Fischer, Wapakoneta, both of Ohio, assignors to Avco Corporation, Coldwater, Ohio

Continuation-in-part of Ser. No. 145,443, May 20, 1971, abandoned. This application Apr. 7, 1972, Ser. No. 242,151
Int. Cl. F16h *29/00*
U.S. Cl. 74—118 **17 Claims**



A breakaway mechanical linkage is comprised of a pair of overlapping elongated elements having opposed ratchet faces on their overlapping portions. The ratchet faces have a first set of ramps of a relatively steep slope and a second set of ramps having a much shallower slope. A number of springs hold the interfitting ratchet faces together at a normal operating length. A given longitudinal force causes the first set of ramps to ride up one another and permit the elements to displace to a different total length. A longitudinal spring brings the elements back to their original position so that the linkage may be reset. This linkage is advantageously used in the conveyor drive mechanism of a manure spreader.

3,769,848

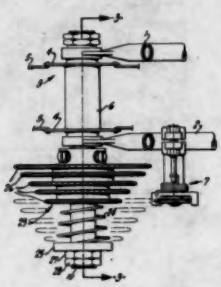
AUTOMATIC SHIFTING MEANS FOR MULTISPEED BICYCLES

Wayne McGuire, 4290 David St., Castro Valley, Calif.

Filed June 26, 1972, Ser. No. 266,245
Int. Cl. F16h *11/00*
U.S. Cl. 74—217 B **7 Claims**

Automatic shifting means for multispeed bicycles of the type having a plurality of chain sprockets mounted on a rear wheel hub. A torque sensing means is provided for automatically shifting the hub axially of a shaft on which it is supported in response to variations in torque. In the preferred form of the invention, a cam track is provided on a shaft on which the hub is peripherally and axially movable and a follower is car-

ried by the hub so as to move the hub axially against the urgency of a spring as the torque on the hub increases. Said spring acts to move the hub axially in the opposite direction as the



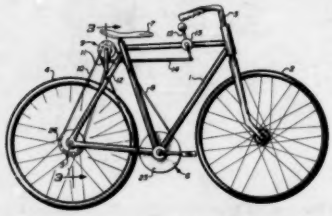
torque decreases. Also disclosed is means for locking the sprocket hub against movement to prevent automatic shifting and additional means is provided to permit manual shifting by a derailer if desired.

3,769,849

BICYCLE WITH INFINITELY VARIABLE RATIO DRIVE

Earl W. Hagen, 312 W. Stella Ln., Phoenix, Ariz.

Filed Aug. 2, 1972, Ser. No. 277,364
Int. Cl. F16h *11/04, 55/22*
U.S. Cl. 74—217 B **4 Claims**



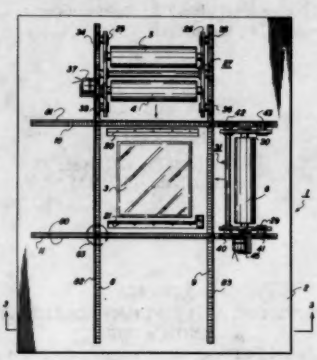
In order to afford an infinite selection of drive ratios, between low speed and high speed extremes, the coaster brake at the bicycle rear wheel, is driven by a foot operated crank through an intermediate variable pitch idler mechanism. The variable pitch idler mechanism is a dual pulley device disposed proximate and beneath the rear portion of the bicycle seat. One pulley side of the variable pitch idler mechanism is coupled through a first relatively wide, tapered-sided belt to the foot operated crank, and the other pulley side is similarly coupled to the coaster brake. The inner halves of the two pulley sections of the variable pitch idler mechanism are coupled together and are free to move laterally on a shaft toward and away from the outer pulley sections. Hence, as the center section moves laterally, the effective diameters of the driving and driven pulley sections varies because one tapered belt will drop deeper into its pulley section as the other belt moves outwardly in its pulley section. The entire variable pitch idler mechanism is pivotally supported for fore and aft movement, and the operating position is determined by the position of a speed selector lever to which the idler mechanism is coupled. By shifting the idler mechanism fore and aft, the tension of the two belts cooperate to shift the inner pulley element laterally to accordingly adjust the overall ratio between the foot operated crank and the coaster brake.

3,769,850

PHOTOELECTROPHORETIC APPARATUS USING PYRAMID GEARS

Robert L. Culligan, Canadice, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 84,832, Oct. 28, 1970, Pat. No. 3,685,897.
This application Apr. 10, 1972, Ser. No. 242,855
Int. Cl. F16h *55/06, 1/04*
U.S. Cl. 74—462 **3 Claims**



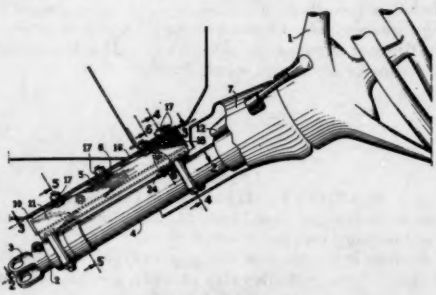
A photoelectrophoretic machine employs a flat transparent plate electrode on which images are made from a photoelectrophoretic ink exposed to electromagnetic radiation projected to the ink through the transparent plate and subjected to electric fields established between the plate and roller electrodes supported for travel over the plate. The rollers are journeled in first and second carriages that travel over the plate along different paths. The carriages are supported on pinion gears mated with rack gears on the four sides of the plate and intersecting one another. Pyramid gears are used at the intersections to enable the pinion gears on one rack to cross over an intersecting rack.

3,769,851

ENERGY ABSORBING DEVICE AND SAFETY STEERING COLUMN FOR A VEHICLE EQUIPPED WITH THE DEVICE

Georges Edme, Audincourt; Robert Fichot, and Georges Oberle, both of Montbeliard, all of France, assignors to Automobiles Peugeot, Paris; Regie Nationale Des Usines Renault, Brillancourt, both of France

Filed May 15, 1972, Ser. No. 253,513
Claims priority, application France, June 7, 1971, 7120562
Int. Cl. B62d *1/18*
U.S. Cl. 74—492 **12 Claims**



Energy absorbing device operating by plastic deformation, for example for a vehicle steering column, comprising a first element having a slot and a second element carrying a project-

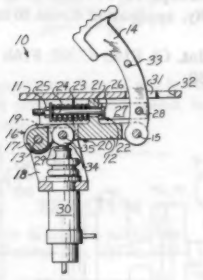
ing member disposed beyond one end of the slot. The width of the projecting member is greater than the width of the slot so as to deform the edge portions of the slot upon relative movement between the elements.

3,769,852

FOOT PEDAL ACTUATING MECHANISM

Gary S. Peifer, Waynesville; James L. Hughes, Warrensburg, and Virgil H. Johnson, Decatur, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 21, 1972, Ser. No. 282,137
Int. Cl. G05g 1/14
U.S. Cl. 74—512 **8 Claims**



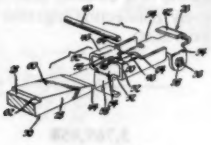
A foot actuated control pedal has a transversely disposed locking pin secured thereon which is adapted to cooperate with a T-shaped slot formed on a floor plate to lock the pedal in an operative position when the pedal is depressed and retracted. The pedal is unlocked when it is depressed and moved forwardly against the biasing force of a compression spring and is returned to its upper, neutral position under the influence of a torsion spring.

3,769,853

FASTENER DEVICE

Floyd A. Schluckebier, Frankenmuth, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 8, 1972, Ser. No. 287,357
Int. Cl. G05g 1/04
U.S. Cl. 74—543 **3 Claims**



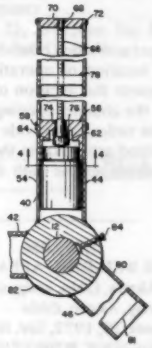
In preferred form a fastener device comprising a sheet metal clip assembly including folded over portions forming a duct with a resilient top surface wherein the duct receives a preformed end of a lever having an abutment thereon and the top surfaces of the duct are expanded when the lever is axially inserted into the duct. The lever is inserted a sufficient distance to position its abutment inwardly of the top surfaces of the duct. The top surfaces, due to their resiliency tend to return to their normal shape and contract against the lever engaging the ramp and thereby prevent withdrawal of the lever from the clip assembly. The clip assembly also includes laterally aligned downwardly extending tabs providing pivotal mounting of the clip in one application on a vehicle turn signal switch assembly. The clip assembly can also include a downwardly depending tab positioned in association with a headlamp dimmer switch so that upward and downward movement of the lever would control the vehicle headlamps. A biasing member is formed integral with the clip to engage the free end of the lever so that its abutment is continually urged into engagement with the resilient top surfaces of the clip. The lever can easily be removed by prying the clip top surfaces upwardly so that the abutment on the lever may move outwardly of the clip assembly through the duct.

3,769,854

STRUCTURE FOR AND METHOD OF AUTOMATIC BALANCING OF A ROTATING MEMBER

Ronald A. Fryzel, Dearborn Heights, Mich., assignor to The Detroit Edison Company, Detroit, Mich.

Filed July 26, 1971, Ser. No. 166,041
Int. Cl. F16f 15/32
U.S. Cl. 74—573 **10 Claims**



Structure for and a method of minimizing static imbalance of a rotating member including a pair of balance arms with adjustable weights thereon positioned at 90° with respect to each other and secured to the rotating member, a velocity responsive member for developing an alternating electric signal, the magnitude of which is proportional to the magnitude of the static imbalance of the rotating member and a computing circuit for reducing the alternating signal proportional to the static imbalance into direct current vector components at right angles to each other aligned with the balance arms and electric motor, screw and nut structures for moving the weights on the balance arms toward and away from the rotating member in accordance with the vector components of the static imbalance signal in a direction to eliminate the static imbalance of the rotating member and the method of operation thereof.

3,769,855

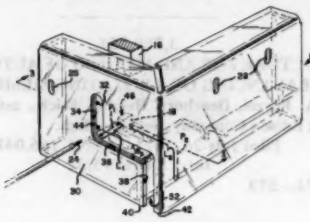
BARRIER GUARD

Ronald Joseph Sebastian, Harrisburg, and David Albert Walker, Steelton, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Sept. 28, 1972, Ser. No. 293,210
Int. Cl. F16p 1/02
U.S. Cl. 74—612 **4 Claims**

A barrier guard attachable about an operating station of a machine has a front wall portion with a slot defined therein and dual side wall portions connected with, and disposed at an angle to, the front portion. The width of the slot is slightly larger than the width of the portion of the article desired to be inserted through the guard and into the location of operation, but the width of the slot is substantially less than the length of a first path of direct access from the slot to the location of operation of the station such that the fingers of the operator

when extended through the slot will not reach the location of operation of the station. The dual side wall portions define a channel having first and second openings at either end thereof, each opening being of a width which is greater than the final width of the inserted article portion, but which is substantially less than the length of a second path of direct access through the channel and to the location of operation such that



the fingers of the operator when extended through the channel will not reach the location of operation of the station. The channel opening nearer the location of operation is disposed substantially above the channel opening remote from the location of operation in order to provide a gravity assist to the removal of the finished article from the location of operation along the second direct access path defined by the channel through the guard.

3,769,856

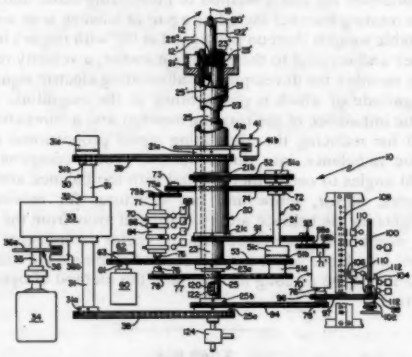
TIRE BUILDING APPARATUS

William R. Casey, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed June 28, 1972, Ser. No. 266,898

Int. Cl. F16h *37/08;* **B29h** *17/16;* **F16d** *67/02*

U.S. Cl. 74—675 **28 Claims**



Apparatus for supporting and actuating a tire building drum which comprises a spindle assembly having in the disclosure three telescopically arranged members coaxial with a common longitudinal axis each of which is connectable to actuate particular parts or elements within the drum. Drive trains, designated primary and secondary, each include selectively operable clutches enabling rotation of the spindle assembly both as a synchronously corotatable unit and alternatively for rotating a selected member relative to the other or others. Geared differential units having two inputs connected respectively to different members of the spindle assembly produce rotational outputs proportional to the relative angular displacement between such connected members. The differential outputs can drive a series of cam lugs past a fixed battery of limit switches or a pointer along a scale to measure and to signal to the relative angular displacement of one member relative to the other as well as to control such relative movement. The parts and elements within the drum required to be moved by the members of the spindle assembly are monitored and controlled.

3,769,857

CHANGE-SPEED GEARING

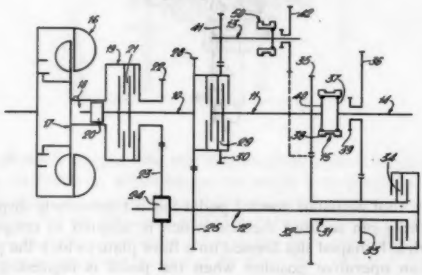
Eric Albert Whateley, Wooldale, Holmfirth, Huddersfield, England, assignor to David Brown Industries Limited, Huddersfield, England

Filed Sept. 16, 1971, Ser. No. 181,156

Claims priority, application Great Britain, Sept. 23, 1970, 45,185/70

Int. Cl. F16h *47/00;* **F16h** *3/08*

U.S. Cl. 74—730 **6 Claims**



A semi-automatic torque transmitting gearbox for a vehicle comprises an input member, first and second shafts co-axial with that member, a layshaft, gearing interposed between the input member and the layshaft and including freewheel means for permitting the layshaft to rotate faster than it can be driven by the input member through that gearing, gearing interposed between the first co-axial shaft and the layshaft which is of lower ratio than the first mentioned gearing, gearing interposed between the second co-axial shaft and the layshaft and including a disengagable clutch for positively connecting those shafts together via that gearing, a disengagable clutch for positively connecting together the first and second co-axial shafts, freewheel means for permitting the input member to rotate faster than the first co-axial shaft, and a disengagable clutch for positively connecting together the input member and the first co-axial shaft.

3,769,858

TRANSMISSION

Richard L. Merrell, Huron; Lubomyr O. Hewko, Port Clinton, and Richard K. Kepple, Huron, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

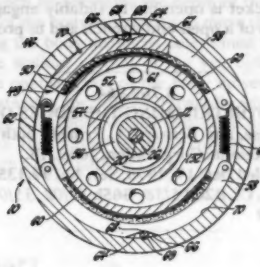
Filed Mar. 3, 1972, Ser. No. 231,504

Int. Cl. F16h *5/60;* **F16d** *43/22*

U.S. Cl. 74—752 E **16 Claims**

The illustrated two-speed accessory drive transmission includes centrifugal clutch shoes and a planetary friction unit, with spring means for urging the shoes into frictional driving contact with a clutch drum and thereby actuating the planetary unit during low engine speeds for driving the output member in overdrive, and a one-way clutch for interconnecting the output and input in a direct drive relationship upon disengagement of the shoes from the clutch drum under the action of centrifugal force, with a pin or roller mounted between

an input member and a ramp formed on the clutch shoes to control disengagement of the clutch at a first predetermined



speed and the reengagement thereof at a lower predetermined speed than the first predetermined speed, in both instances without undue slippage.

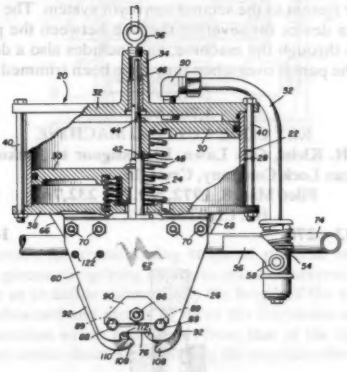
ERRATUM

For Class 74—682 see:
Patent No. 3,770,879

3,769,859
SEALING MECHANISM

Theodore J. Sykes, South Holland, and Edward Staron, Chicago, both of Ill., assignors to Interlake, Inc., Chicago, Ill.

Filed June 21, 1971, Ser. No. 154,736
Int. Cl. B25b *25/00*
U.S. Cl. 81—9.1 **1 Claim**

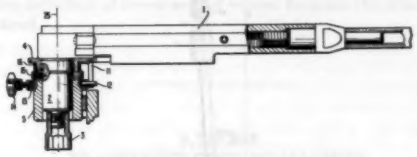


A power sealing mechanism for forming tension resisting joints in overlapping portions of bundle encircling and load retaining tensioned strapping and a seal blank has an air pressure operated cylinder-piston combination with a projecting piston rod connected to drive the joint forming mechanism mounted in a frame which in turn is mounted on the cylinder. The joint forming mechanism includes pairs of strapping and seal blank engaging jaws or bending dies pivotally mounted on the frame and at least one pair of rotatable deforming dies or punches rotatably mounted on the frame adjacent the jaws. The jaws are connected to be pivoted by the piston rod to have relative movement with respect to the deforming dies to cause the jaws to fold the seal blank closely about the overlapping strapping portions and to force the seal blank into engagement with the deforming dies to deform the sandwich of seal blank and the strapping portions into a tensioning resisting joint. The advancing piston rod carries a cam-like abutment to pivot a latch having first and second stops to a position where a spring pressed detent retains the latch at the end of the advancing and joint forming movement of the piston rod. The first stop would be engaged by the abutment upon too early withdrawal of the piston rod and thus prevent retraction of the joint forming dies unless the mechanism had been fully advanced. The second stop is engaged by the abutment near the end of the normal retraction of the piston rod after a complete joint forming operation so as to release the latch from its detent and to condition the mechanism for a subsequent joint forming operation.

3,769,860
WRENCH, ESPECIALLY TORQUE WRENCH

Horst Frings, Schmiden; Gunter Braun, Berg; Ernst Mosle, and Ludwig Schmid, both of Friedrichshafen, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Apr. 22, 1971, Ser. No. 136,471
Int. Cl. B25b
U.S. Cl. 81—52.5 **39 Claims**

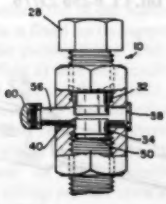


A wrench, especially a torque wrench, for tightening highly stressed nuts, bolts and the like, in which a torque-measuring device and an angular rotation measuring device are provided, which include transmitting elements secured at these devices; the transmitting elements are movable preferably parallel to one another and in the same direction upon actuation of the wrench with increasing torque and increasing angular rotation in the screw-tightening direction whereby the transmitting elements are connected with each other by way of an intermediate element which locks a release mechanism during relative movements of the transmitting elements in one direction of rotation and initiates a signal upon reversal of the direction of rotation by way of the release mechanism.

3,769,861
STUD WRENCH

Adolph J. Kisle, 27855 Via Ventana, Los Altos Hills, Calif., and George Brase, 1797 California St., Apt. 23, Mountain View, Calif.

Filed May 4, 1972, Ser. No. 250,420
Int. Cl. B25b *13/50*
U.S. Cl. 81—53.2 **10 Claims**



A wrench for gripping and turning threaded studs to cause their removal from other structure comprises a main body for

engaging the stud and a tapered pin extending transversely through the main body and through a jaw maans within the body. With the pin in a fully inserted transverse position, the main body is threaded to the stud until it engages the lower end of the jaw means. A take-up nut having left handed threads is threaded into the upper end of the main body until it bears against the jaw means. The tapered pin and the internal jaw means are movable a small amount axially within the main body so that when the take-up nut is tightened the lower end of the jaw means will bear firmly against the end of the stud, thereby locking the main body to the stud and enabling the turning of the main body to unscrew the stud. Transverse movement of the pin in the main body serves to release the wrench from the stud.

3,769,862

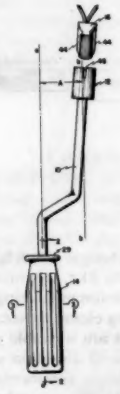
WIRE NUT TOOL

Leslie T. Miller, Murray, Utah, assignor to Speedriver Tool Corporation, Salt Lake City, Utah

Continuation-in-part of Ser. No. 85,074, Oct. 29, 1970, abandoned. This application May 17, 1972, Ser. No. 254,077

Int. Cl. B25b *13/06, 13/50*

U.S. Cl. 81—90 D **15 Claims**



A wire nut tool which includes a sleeve having an open end and an opposite connecting end, a first cavity in the sleeve proximate the open end sized to receive at least a portion of a wire nut, and a second opening proximate the opposite end of the sleeve sized to receive a second wire nut. Slots are formed in the sidewalls of the sleeve proximate the open end for receiving the turning wings of a first wire nut and second slots are positioned in the sidewalls of the sleeve proximate its connecting end for receiving the turning wings of a second smaller sized wire nut.

3,769,863

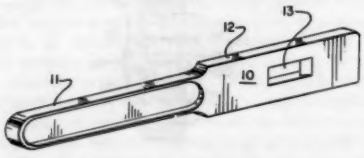
SWEDE FOR OPEN-END WRENCHES

William D. Griffin, Box 246, Underwood, Wash.

Filed Mar. 13, 1972, Ser. No. 234,000

Int. Cl. B25b *23/16*

U.S. Cl. 81—177 A **3 Claims**



The swede for open-end wrenches of the present invention comprises a handle portion having a substantially elongated configuration along the rectilinear axis of the swede, and a body portion disposed along the rectilinear axis of the swede having a substantially rectangular wrench-engaging socket having its rectilinear axis along the rectilinear axis of the swede. The socket is operable to slidably engage one of the projecting jaws of a open-end wrench and to provide leverage thereto.

3,769,864

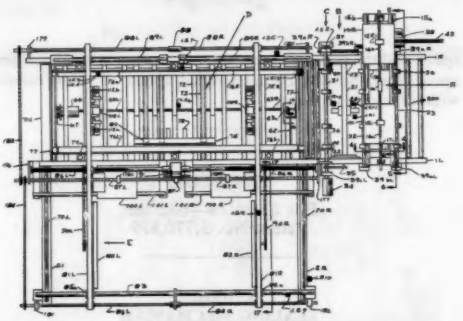
MACHINE FOR TRIMMING THE EDGES OF PANELS

Donald B. Morse, and Bernard A. Pribish, both of Joliet, Ill., assignors to Kemlite Corporation, Joliet, Ill.

Filed Dec. 17, 1970, Ser. No. 99,135

Int. Cl. B26d *5/38;* **B65h** *35/02, 35/04*

U.S. Cl. 83—79 **15 Claims**



A machine for trimming the edges of panels wherein a first conveyor mechanism passes the panels past a pair of saws for trimming the side edges of the panels and a second conveyor mechanism passes the panels past a second pair of saws for trimming the end edges of the panels. The machine has transfer mechanism for transferring the panels from the first conveyor system to the second conveyor system. The machine includes a device for severing the web between the panels as they pass through the machine, and includes also a device for turning the panels over when they have been trimmed.

3,769,865

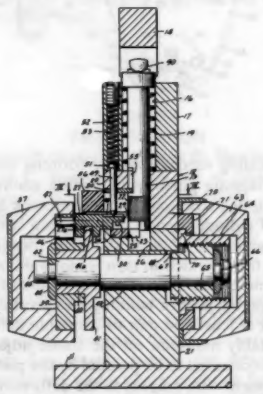
KEY CODE CUTTING MACHINE

Herbert H. Kleist, Oak Lawn, Ill., assignor to Junkunc Bros. American Lock Company, Crete, Ill.

Filed Mar. 8, 1972, Ser. No. 232,782

Int. Cl. B26d *5/20, 7/06*

U.S. Cl. 83—278 **14 Claims**



Device for warding key blanks to code in the form of a punch and stationary anvil having a die face in the form of the

deepest ward to be cut in the key. A key holder is slidably movable along the body of the device and laterally of the body towards and from the punch and holds the key to the face of the anvil and moves the key laterally relative to the face of the anvil and punch to determine the depth of the wards. A knob on one side of the body is provided to move the key holder inwardly along the body distances determined by the distances between the stations or pins of the key cylinder. A second knob on the opposite side of the body moves the key holder and blank laterally inwardly or outwardly with respect to the body through a threaded drive connection to the key holder, to determine the depths of the wards of the blank in accordance with a code pattern.

3,769,866

DEVICE FOR TRANSFORMING STRIPS OF MATERIAL INTO DIMENSIONED PIECES

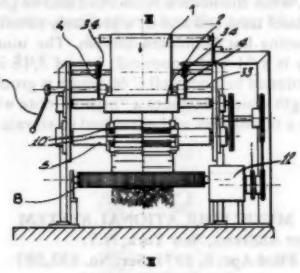
Andre Pietrucci, 6, rue Andre-Dessaux; Pierre Imbert, 30, rue des Fosses, both of Fleury-Les-Aubrais; Jean Berthou, 3 bis, rue des 3 Croissants, Orleans, and Claude Juston, 16, rue Anatole, St. Jean De Braye, all of France

Continuation of Ser. No. 871,726, Aug. 13, 1969. This application Aug. 16, 1971, Ser. No. 171,959

Claims priority, application France, Sept. 2, 1965, 6530168; Mar. 31, 1966, 6655929

Int. Cl. B26d *1/36*

U.S. Cl. 83—302 **9 Claims**



A device for transforming strips of material into dimensioned pieces comprising means to make transverse cuts in the strip so as to define substantially the length of the short pieces to be obtained and means to recut the fragments so obtained in a direction which is different from that of the initial cut in order to obtain short pieces having the requisite dimensions.

3,769,867

VENEER CLIPPING APPARATUS

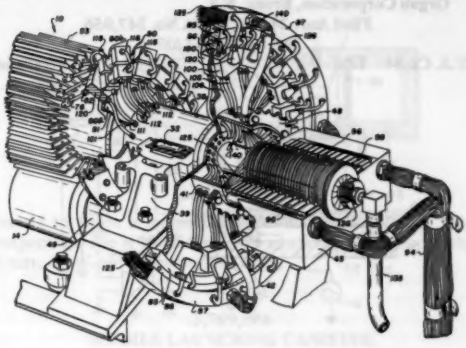
Walter W. Schilling, Delta, British Columbia, Canada, assignor to MacMillan Bloedel Limited, Vancouver, British Columbia, Canada

Filed Jan. 28, 1972, Ser. No. 221,531

Int. Cl. B23d *25/12*

U.S. Cl. 83—338 **17 Claims**

Veneer clipping apparatus including a rotatable drum having a plurality of axially-extending knives arranged around and projecting from its surface, and power means connected to the knives for selectively moving the knives radially outwardly and inwardly between extended and retracted positions. The apparatus can be operated automatically by scanning means



or manually from a position ahead of the drum with reference to the direction of movement of veneer between the drum and an anvil.

3,769,868

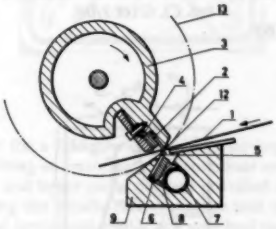
TRANSVERSE CUTTING MACHINE

Hans Hornung, Zwingenberg, Germany, assignor to Dr. Otto C. Strucker K. G., Darmstadt-Eberstadt and Maschinenfabrik zum Bruderhaus G.m.b.H., Rautlingen, Wuerttemberg, Germany

Filed Apr. 19, 1971, Ser. No. 135,318

Int. Cl. B23d *25/12*

U.S. Cl. 83—348 **11 Claims**



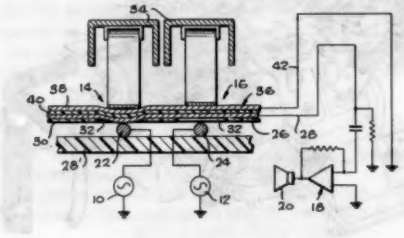
A transverse cutting machine has stationary and rotatable blade supports and blades with the stationary blade projecting into the path of rotation of the rotating blade a distance of around 0.1 millimeter. One of the blades is fixed in its support, and the other blade is fixed on its support against movement in the direction of the cutting force. This other blade is formed with a curved surface at one end leading into its cutting edge so that, on contact with the fixed blade, it displaces or deflects in a direction normal to the direction of the cutting force against a pressurized fluid bias provided by an expansible, pressurized tube which also affords a quick release for blade changing. Because of the permitted deflection, blade tolerances during set-up are not critical, and the control exercised over the fluid bias permits easy adjustment of cutting forces. In one embodiment, the biased blade is the rotatable blade, and in another embodiment, the biased blade is the stationary blade.

3,769,869

ELECTRONIC MUSICAL INSTRUMENT KEYING ASSEMBLY PROVIDING A MINIMUM OF ELECTRICAL NOISE

Carl S. Nelson, Jr., Los Angeles, Calif., assignor to Opsonar Organ Corporation, Bronx, N.Y.

Filed Apr. 24, 1972, Ser. No. 247,056
Int. Cl. G10h *1/00*
U.S. Cl. 84—1.01 **5 Claims**



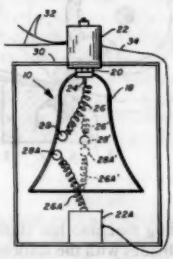
A switch for an electronic organ or other electronic instrument, which produces a minimum of electrical noise even when low level electrical signals pass through the switch for later high gain amplification. The switch includes a cylindrical wire connected to a tone generator, and a strip of conductive elastic material which can be deflected against the wire and that spreads onto the wire to gradually increase the contact area therewith and decrease the contact resistance. An electrically conductive lubricant is applied to the wire and elastic strip so that as the elastic material of the strip spreads under pressure, the spreading portions smoothly slide outwardly. An insulator strip is fastened to the elastic conductive strip, and another elastic conductive strip is fastened to the insulator and is grounded, to shield the first conductive strip from stray electrical currents.

3,769,870

CAROLING BELLS

Alvin J. Huber, 5738 E. 61 Pl., Tulsa, Okla.

Filed Jan. 12, 1973, Ser. No. 323,273
Int. Cl. G10f *1/08*
U.S. Cl. 84—103 **10 Claims**



This invention describes an improved caroling bell system in which the bell striker is driven by a rotary drive motor, and the striker element is a mass supported on a flexible element, which is mounted coaxially with the shaft of the drive motor.

The drive motor is conveniently mounted axially of the bell, the shaft being introduced through an opening in the closed end of the bell with the striker inside the bell.

The striker can be controlled by a manual keyboard, by an automatic contact making device, etc. However, the preferred arrangement is to use an electrical musical signal including a plurality of frequency components. A plurality of band pass filters are connected in parallel to the electrical signal. Each band pass filter is connected to a separate bell. The natural frequency of each bell is different and is within the pass band of the corresponding filter. Thus, when a musical selection is provided as the electrical signal, the filters will sound their bells whenever the musical tone includes the frequency component covered by the band pass of that particular filter. Thus, the music will be reproduced by the bells in accordance with the electrical signal.

3,769,871

STONE GUITAR WITH TUNED NECK

Joel M. Cawthorn, P.O. Box 361, Shady, N.Y.

Filed Apr. 25, 1972, Ser. No. 247,348
Int. Cl. G10h *1/08, 3/00*
U.S. Cl. 84—291 **8 Claims**

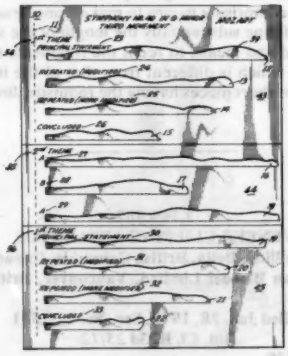
Disclosed herein is a new and improved electric guitar having a stone body in which is housed conventional electronic pickup means, controls and the like, and a uniquely reinforced, "tuned" neck construction providing a new and improved musical instrument with outstanding sustain and high frequency resonanting effects. Specifically, the body is formed from a comparatively heavy stone slab, typically 1 to 1⅛ inches thick, while the neck is reinforced and its geometry stabilized by a steel truss rod and by a precisely tuned, steel reinforcing or tuning bar laminated therein. The tuning bar advantageously is a 21 inch (nominal) bar of 5/16 inch square tool steel hardened to Rockwell C 60 which is ground down to a precise length which produces a "high E" note when the bar is struck like a tuning fork and permitted to vibrate. rmitted to vibrate.

3,769,872

MUSIC EDUCATIONAL SYSTEM

Violet Katzner Andrews, New York, N.Y.

Filed Apr. 8, 1971, Ser. No. 132,587
Int. Cl. G09b *15/00*
U.S. Cl. 84—470 **4 Claims**



A visual-aural combination: the visual component embodied by a playing board having a plurality of positions

formed to receive a plurality of movable members representing consecutive musical units, the aggregate of all the musical units when positioned on the playing board forming a composite musical design; the aural component, closely correlated with the visual component, embodied in a phonorecord capable of reproducing by selection individual musical units, groups of musical units, and finally, the aggregate of all the musical units continuously as a composite musical design.

3,769,873

PROCESS FOR UNIFORMLY DEPOSITING RESIN IN COMBUSTIBLE CARTRIDGE CASES

William A. Abel, Joliet, Ill., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 25, 1972, Ser. No. 220,642

Int. Cl. F42b *5/26;* **D21j** *1/08;* **B44d** *1/44*

U.S. Cl. 86—1 R **7 Claims**

A process to control resin migration in combustible cartridge cases composed of nitrocellulose fibers and cellulose fibers is provided by adding to the conventional method the step of dipping the already formed and resin impregnated case into a liquid which is miscible with the solvent used to impregnate the resin into the felted cartridge case, but which is a non-solvent for the resin thereby precipitating the resin in situ and subsequently completing the formation of the case by drying.

3,769,874

METHOD OF PUMPING EXPLOSIVE SLURRY

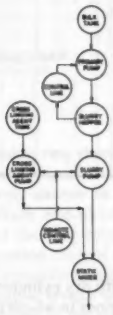
Darrell Andrew Williams, West Heidelberg, and Adam Prus Wisinski, Parkdale, Victoria, both of Australia, assignor to ICI Australia Limited, Melbourne, Victoria, Australia

Filed July 24, 1972, Ser. No. 274,430

Claims priority, application Australia, Aug. 16, 1971, 5915

Int. Cl. F42d *1/00*

U.S. Cl. 86—20 C **4 Claims**



The invention is to a method of filling bore-holes by pumping an explosive slurry by a primary pump through a hose more than 50 ft. in length to a secondary unit in a restricted underground space. From the secondary unit the explosive slurry is pumped through a hose inserted in a borehole and an additive is pumped into the explosive slurry. Control devices for controlling the flow of explosive slurry are provided.

3,769,875

ACTUATING MECHANISM

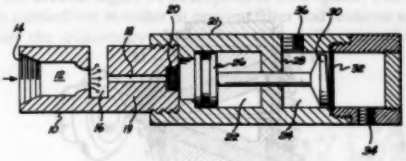
Edward L. Rakowsky, Kinnelon, N.J., assignor to The Singer Company, New York, N.Y.

Division of Ser. No. 869,487, Oct. 27, 1969. This application Nov. 16, 1971, Ser. No. 199,390

Int. Cl. F41f *1/04*

U.S. Cl. 89—1 B **2 Claims**

An actuating mechanism in which a source of fluid is directed against an end wall of a rigid body portion having an open cavity formed therein to create pressure waves of fluid which pass through the length of the cavity to the closed end thereof to cause a temperature rise at the closed end. This temperature rise is utilized to ignite an explosive device which, in turn, is utilized to accomplish work.



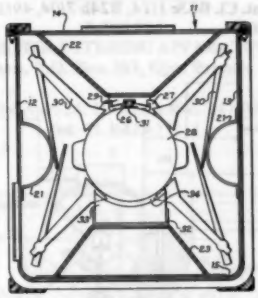
3,769,876

MISSILE LAUNCHING CANISTER

Charles B. Haas, Spotsylvania, Va.; Richard E. Taylor, Hyattsville, Md.; David E. Crockett, James F. Miller; Howard R. Paul, and Charles J. Reid, all of Louisville, Ky., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 2, 1972, Ser. No. 277,701

U.S. Cl. 89—1.8 **2 Claims**



A canister for a foldable-wing missile serving a duel function of providing an environmental container and a launching tube. Upper and lower guide rails are provided in the canister for supporting the missile during storage and during launch, and a pair of horizontal guides are attached one each to the sides of the canister to serve as stiffeners and guides for folded missile wings. Frangible covers are provided for closing the front and aft of the canister and locking devices are provided on the canister to lock a missile in position until launch.

3,769,877

CRADLE OF A GEAR-CUTTING MACHINE

Vasily Nikolaevich Kedrinsky, Profsojuznaya ulitsa, 40, kv. 85, Moscow, and Boris Grigorievich Zudov, Zhiluchastok Zavoda Zuboreznykh, Stankov, 31, kv. 24, Saratov, both of U.S.S.R.

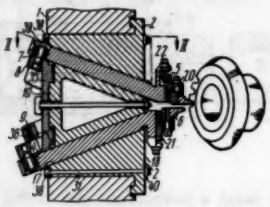
Continuation of Ser. No. 836,852, July 12, 1971, abandoned. This application July 12, 1971, Ser. No. 161,898

Int. Cl. B23f *5/12*

U.S. Cl. 90—6 **6 Claims**

A cradle for a bevelled gear generating machine comprising two slidably mounted tool holding arms pivotably connected to respective levers, each in turn being supported on an axle spaced from the pivot axis of the arms to the levers. Each arm

can be pivotably moved about its respective pivotal connection with the lever and each lever can be pivotably moved about its axle, the latter movement being in a direction substantially perpendicular to the pivotal movement of the arm relative to the levers, so that the combined movements of the



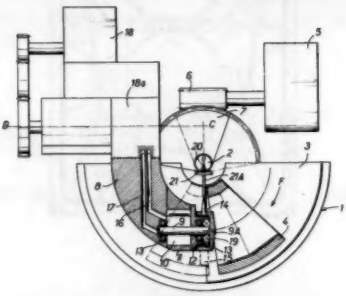
levers and its respective arm can move the tool carried by the arm along a predetermined closed path. Each tool holding arm is slidably mounted inside a turnable segment within the cradle for setting the tool carried by the arm at a desirable tooth angle of the gear to be machined.

3,769,878

MACHINE TOOL FOR MACHINING COMPONENTS WITH TOROIDAL SLIDING SURFACES

Guy Emile Louis Servanty, Noisy-le-Roi, France, assignor to Societe D'Etudes Et De Recherches Appliquees S.E.R.A.P., Lechesnay, France

Filed Jan. 7, 1972, Ser. No. 216,173
Int. Cl. B23c *1/14*; B24b *7/04, 49/12*
U.S. Cl. 90—20 **4 Claims**



A machine tool for machining components with toroidal surfaces comprising a fixed support which provides the virtual axis of revolution of the torus to be machined, a mobile table rotatively mounted about the axis and having drive means for rotating the table, and a working head provided with a tool the working plane of which is adjustable relative to the axis and is adapted to be aligned with the axis.

ERRATUM

For Class 91—171 see:
Patent No. 3,769,881

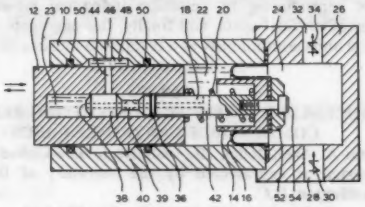
3,769,879

SELF-COMPENSATING DIAPHRAGM PUMP

Alden A. Lofquist, Jr., 10 Rita Way, Orinda, Calif.

Filed Dec. 9, 1971, Ser. No. 206,260
Int. Cl. F01b *19/00*; F16j *3/00*
U.S. Cl. 92—84 **19 Claims**

A self-compensating diaphragm pump wherein a valve arrangement operating according to the diaphragm position permits hydraulic fluid from a reservoir maintained at a pressure greater than the pump inlet pressure and less than the pump



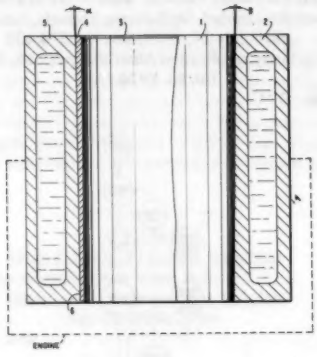
outlet pressure to compensate for hydraulic fluid volume variations in the piston chamber adjacent the diaphragm.

3,769,880

CYLINDER HOUSING WITH DRY CYLINDER LINERS

Milorad Mirjanic, Fellbach (Wurtt), Germany, assignor to Daimler-Benz Aktiengesellschaft

Continuation of Ser. No. 22,838, March 26, 1970, abandoned.
This application Feb. 29, 1972, Ser. No. 230,413
Int. Cl. F16j *11/04*
U.S. Cl. 92—169 **17 Claims**



A cylinder housing with dry cylinder liners, in particular for internal combustion engines in which the outer surfaces of the cylinder liners taper conically and the cylinder bores also preferably taper conically.

3,769,881

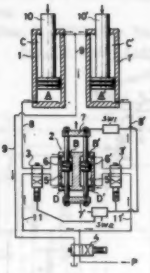
HYDRAULIC DEVICE

Katashi Aoki, 6037 Oaza Minamijo, Sakaki-Machi, Hanishina-gun, Nagano-ken, Japan, Sakaki, Japan

Filed June 9, 1971, Ser. No. 151,393
Claims priority, application Japan, June 17, 1970, 45/52077
Int. Cl. F01b *25/04*; F15b *11/22*
U.S. Cl. 91—171 **4 Claims**

A hydraulic device comprising a plurality of hydraulic cylinders, a synchronizing device having fluid chambers of the same number as that of the hydraulic cylinders but having far smaller inside volume than that of the hydraulic cylinders, each fluid chamber including a synchronizing piston within the chamber, all of said pistons being rigidly connected together so that the pistons are operable simultaneously, and transfer valves of a number equal to that of the hydraulic cylinders, cylinder heads of the hydraulic cylinders being con-

nected to cells formed at one side of the fluid chambers of the synchronizing device, cells formed at another side of the fluid



chambers being connected to a pressurized fluid source, and the transfer valves being connected in these connection lines.

3,769,882

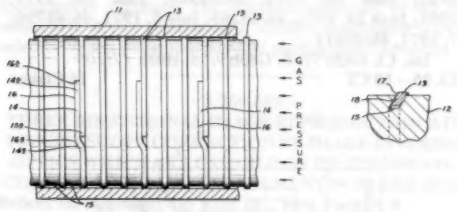
BIAS-GROOVE PISTON AND RING THEREFOR

William Josephian, 2311 Magnolia St., Oakland, Calif.

Continuation-in-part of Ser. No. 4,230, Jan. 20, 1970, Pat. No. 3,656,768. This application Sept. 24, 1971, Ser. No. 183,435The portion of the term of this patent subsequent to Apr. 18, 1989, has been disclaimed.

Int. Cl. F16j *9/04*

U.S. Cl. 92—172 **5 Claims**



A piston and compression ring therefor useful in high pressure gas compressors and expanders having self-lubricated rings. The ring is relatively narrow in its axial dimension and has an angular length from end-to-end thereof in excess of 360°, one end portion of the ring being offset axially so as to overlap the other end portion thereof and reinforce the same. The piston provides a circumferential ring groove that is enlarged axially over an angular length sufficient to seat such offset overlapping end portions of the ring therein; and the ends of the groove as defined by the axial enlargement thereof and the respectively cooperative portions of the ring are in close proximity and are all parallel so as to prevent the ring from rotating but permit it to expand as it wears without increasing the likelihood of leakage therepast. The ring and groove therefor are each biased or inclined inwardly and axially and have a somewhat frusto-conical configuration.

3,769,883

APPARATUS FOR REGULATING THE OPERATION OF FILTER ROD MAKING MACHINES

Heinz Greve, Hamburg, Germany, assignor to Hauni-werke Korber & Co., KG, Hamburg, Germany

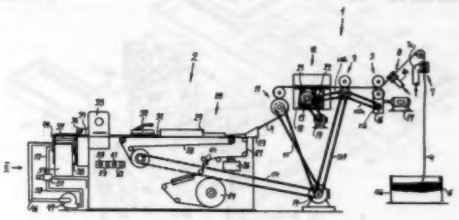
Filed Apr. 1, 1971, Ser. No. 130,287

Claims priority, application Germany, Apr. 11, 1970, P 20 17 361.9

Int. Cl. B31c *13/00*

U.S. Cl. 93—1 C **10 Claims**

Filter rod sections which are produced in a variable-speed filter rod making machine are automatically expelled from the flutes of a transfer drum in response to any changes in the speed of the machine. Such changes may involve acceleration of the machine from zero speed to a first speed, acceleration from the first speed to a second higher speed, deceleration from the second higher to the first speed, and deceleration from the second higher or first speed to zero speed. The ejection is carried out in order to prevent filter rod sections which contain the customary plasticizing or bonding agent from



remaining in the machine when the machine is idle, and to prevent filter rod sections which contain insufficient or excessive quantities of bonding agent from reaching the same destination as the satisfactory sections when the machine is started or accelerated from a lower to a higher speed. The application of bonding agent to the filaments of the tow which is to form the fillers of filter rod sections is terminated in immediate response to actuation of the device which causes a deceleration of the machine.

3,769,884

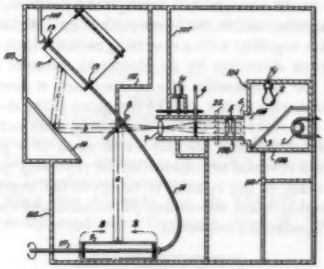
PHOTOLETTERING APPARATUS

Theodore Sigman, P.O. Box 383, Ojus Branch, North Miami, Fla.

Filed Apr. 24, 1972, Ser. No. 247,035

Int. Cl. B41b *21/14*

U.S. Cl. 95—4.5 **7 Claims**



A device to provide visual composing of photolettering which includes a photoluminescent flexible film and a separate sensitized material and means to synchronously and simultaneously create an image on both the film and material and to move the film and material to adjust the position of successive characters in use. By means of a beam-splitter mirror, there is simultaneously projected an identical image onto the film and sensitized material. A dual light source is included which selectively provides: (1) a composing light, insufficient in energy or of such spectral frequency that it is incapable of energizing either the photoluminescent material or the sensitized material, which is used to visually position a new character to be imaged in desired relationship to the previously projected and exposed character; and (2) after the desired composition is attained, a light of sufficient energy and spectral frequency (a) to cause a luminescent image to appear on the photoluminescent material and (b) to expose the sensitized material. The image is then used in conjunction with the new character for composition.

3,769,885

DEVICE FOR EXPOSURE OF PHOTOMATERIAL IN HAND-OPERATED PHOTOCOMPOSING DEVICES

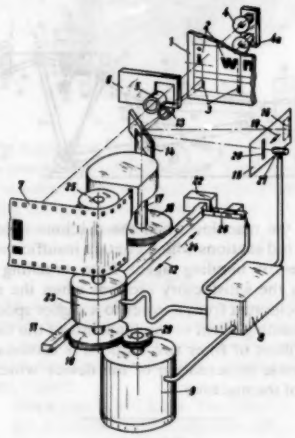
Hans Linde, Berlin, Germany, assignor to Firma H. Berthold AG, Berlin, Germany

Filed July 26, 1972, Ser. No. 275,121

Claims priority, application Germany, July 26, 1971, P 21 37 934.0

Int. Cl. B41b *15/32, 17/40*

U.S. Cl. 95—4.5 2 Claims



Device for the photographic composition of characters with random widths which are not divisible into sub-units, which are determined by control marks on a character support associated with the characters, and which control marks control advance of a film by means of a sensing device, before the character support is subsequently released and the next character can be brought into a projected position, a pivoting mirror being disposed in the beam path of an optical sensor for a width mark together with a reversing motor which is actuatable in a given direction by an electronic control simultaneously with the illumination of a symbol, and is connected via toothed gears with a rack, one of the gears being directly coupled with the reversing motor and being connectable via a coupling to an element for the width shaft of a photo-layer support upon reversal of rotation of the reversing motor, after the width value of the symbol to be set-in has been stored by opposed analog linear movement of the rack and the illumination of the symbol is completed.

3,769,886

SHUTTER OPERATING MECHANISM HAVING AN AUTOMATIC EXPOSURE TIME CONTROL MEANS FOR PHOTOGRAPHIC CAMERA

Naoyuki Uno; Katsuhiko Nomura, both of Kawagoe; Tadazumi Sakazaki; Koichiro Watanabe, both of Tokyo; Katsuhiko Miyata, Kawasaki, and Fumio Urano, Tokyo, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

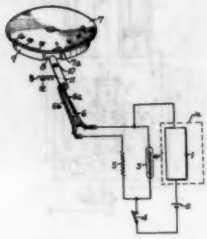
Filed July 27, 1972, Ser. No. 275,784

Claims priority, application Japan, Aug. 6, 1971, 46/69820

Int. Cl. G03b *9/62*

U.S. Cl. 95—10 C 7 Claims

A photographic camera with an automatic exposure control means, an exposure time control circuit for initiating the closure of the camera shutter and a film frame number indicating mechanism having non-usable and usable frame indications. A shutter closure urging circuit is operably connected into the exposure time control circuit and has connected therein a switch to render effective and ineffective the shutter closure urging circuit. A lever actuates the switch to render effective the shutter closure urging circuit when the indicating mechanism is providing the non-usable frame indication and



for rendering ineffective the shutter closure urging circuit when the indicating mechanism is providing the usable frame indication.

3,769,887

ELECTRICAL SHUTTER-CONTROL SYSTEMS FOR CAMERAS

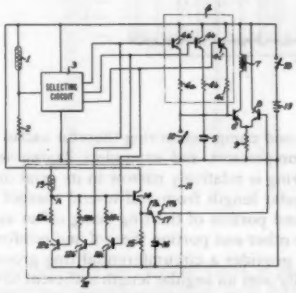
Tsukumo Nobusawa, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed May 19, 1972, Ser. No. 255,217

Claims priority, application Japan, May 31, 1971, 46/36921; June 16, 1971, 46/42500; June 16, 1971, 46/42501; June 24, 1971, 46/45265; July 5, 1971, 46/48790; July 7, 1971, 46/49611

Int. Cl. G03b *7/08;* G03b *9/58;* H03k *17/100*

U.S. Cl. 95—10 CT 16 Claims



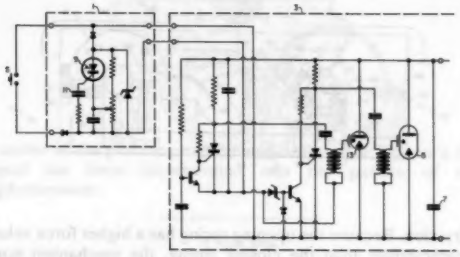
An electrical shutter-control system to be used in a camera. The system includes a solenoid which responds to a signal for initiating shutter-closing operations. A signal-transmitting circuit transmits the signal to the solenoid and receives one of a plurality of timing signals from a timing circuit which is automatically operated to select a timing signal which will provide the best exposure. A signal-altering circuit detects when the conditions require a change in the selected timing signal for improving the exposure, and this signal-altering circuit measures the extent to which the selected timing signal should be changed and alters the timing signal accordingly so that the altered timing signal is transmitted to the solenoid for improving the exposure. The alteration in the timing signal is determined in accordance with a fractional interval of time between the time increments corresponding to the timing signals, so as to achieve a continuous exposure time adjustment, or according to non-linear film characteristics to compensate for the latter characteristics, or in accordance with both of these factors.

3,769,888

COMPUTER FLASH LIGHT SENSING APPARATUS

Peter T. Quinn, Littleton, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 6, 1971, Ser. No. 204,867
Int. Cl. G01j 1/46
U.S. Cl. 95—10 CE 9 Claims



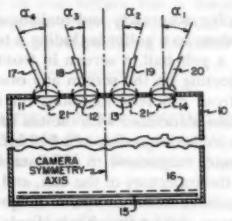
A light sensing apparatus of a computer-type photoflash system is independently moveable with respect to an associated camera and flash unit. It includes a light responsive device, operable to sense light received from a scene being photographed and provide an electrical effect upon sensing a predetermined amount of that light, and a calculator means device, operable to set in selected values of various independent photographic variables and to display values of photographic variables dependent upon the selected values of the independent variables. The effective sensitivity of the light responsive device is adjusted in variable accordance with the selected values of the independent photographic variables.

3,769,889

THREE DIMENSIONAL IMAGE REPRODUCTION WITH PSEUDO-SCOPY CORRECTION BY IMAGE INVERSION OPTICS WHICH ARE CAPABLE OF INDEPENDENTLY CONTROLLING ZcAXIS PLACEMENT IN IMAGE SPACE

Robert M. Wechsler, 475 FDR Dr., New York, N.Y.

Filed Feb. 9, 1972, Ser. No. 224,793
Int. Cl. G03b 35/08
U.S. Cl. 95—18 P 27 Claims



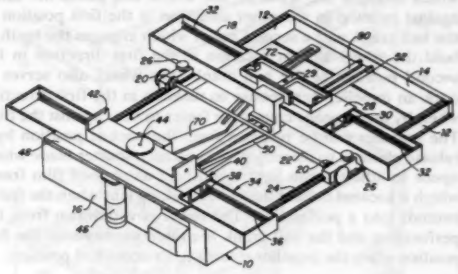
A method of producing multiple perspective, autostereoscopic images is disclosed along with a camera employing the method, which lends itself to inexpensive construction and which may be hand-held to take pictures with excellent depth illusion and virtually free of Z-axis compression with exposure times appropriate to conventional photography. The camera employs a selector screen and is constructed such that any point in object space viewed by the camera may be imaged anywhere along the depth axis of the picture, in image space, so that the image may be made of any extent desired, a virtual image, independently of camera focus by contrclling the orientation relative to the camera axis of the optical image-reversal elements employed for pseudoscopy correction or by providing additional optical elements associated with each such image reversal element for optically effectively controlling such orientation.

3,769,890

AUTOSTEREOGRAPHIC APPARATUS

Alfred V. Alasia, Whitestone, N.Y., assignor to Photogenex Inc., King of Prussia, Pa.

Filed June 30, 1972, Ser. No. 268,177
Int. Cl. G03b 35/08
U.S. Cl. 95—18 P 17 Claims



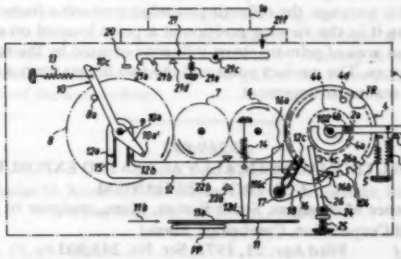
Apparatus for use in autostereography for moving the objective lens of a camera and the camera back transverse to a subject along parallel linear paths between extreme positions. The apparatus includes a linkage for moving the lens and back relative to one another during exposure, the back being moved more rapidly than the lens so that the distance traveled by the back between the extreme positions thereof is greater than the distance traveled by the lens. Another linkage is included for pivoting the back about an axis perpendicular to the direction of linear motion and parallel with the plane of a photosensitive element mounted in the back. The back is pivoted through a predetermined angle with respect to the lens during movement of the lens and back between their extreme positions. The spacing between the lens and back is variable for focusing, and the linkages automatically vary the relative movement of the lens and back in inverse relation to the space therebetween while maintaining constant the angle through which the back is pivoted relative to the lens during movement of the lens and back between their extreme positions.

3,769,891

PHOTOGRAPHIC APPARATUS

Hubert Hackenberg; Rainer Spinnler, and Horst Karl, all of Munich, Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 23, 1971, Ser. No. 127,237
Claims priority, application Germany, Mar. 26, 1970, P 20 14 671.8
Int. Cl. G03b 19/04
U.S. Cl. 95—31 AC 29 Claims



A still camera for use with film having a row of perforations, one for each film frame, has a toothed film transporting wheel

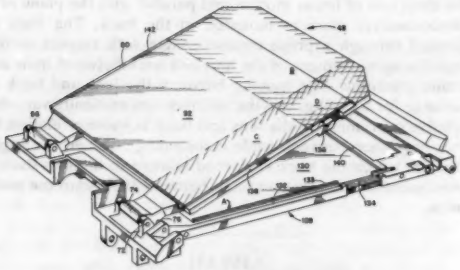
which is rotatable by a rapid-transport lever in a first direction to rotate the takeup reel in a direciton to collect the film, and is permanently biased in the other direction. The feeler of a scanning lever is biased against the film in response to rotation of the wheel in the first direction to penetrate into an oncoming perforation and to thereby move a bell crank from a first to a second angular position. The bell crank has a first pallet which engages the teeth of the wheel and holds the latter against rotation in the other direction in the first position of the bell crank and a second pallet which engages the teeth to hold the wheel against rotation in the first direction in the second position of the bell crank. The wheel also serves to cock an impeller in response to rotation in the first direction whereby the impeller causes the feeler to bear against the film. The impeller can be released from the cocked position by a release element to thereby strike against a shutter blade which opens to admit scene light against an unexposed film frame which is located behind the picture taking lens when the feeler extends into a perforation. The feeler is withdrawn from the perforation and the bell crank is caused to reassume the first position when the impeller returns to its uncocked position.

3,769,892

SEATING ARRANGEMENT FOR A REFLECTING MEMBER

William Patrick Lane, Taunton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 6, 1971, Ser. No. 204,959
Int. Cl. G03b *19/12*
U.S. Cl. 95—42 **12 Claims**



In a reflex camera, an arrangement for properly positioning a reflecting member at a viewing plane and minimizing warpage to a viewing surface attached to the reflecting member. The reflecting member is pivotally moved about a hinge arrangement located along one edge of the reflecting member. The forces employed to move the reflecting member, as well as the forces used to retain the reflecting member at its viewing position are applied to the reflecting member through the hinge arrangement. In order to alleviate possible warpage, the reflecting member contacts a frame supporting it in the viewing position at a point located on a line with an area of primary stress influence created by the retaining forces. The contact point and the two hinges form a three point seating arrangement.

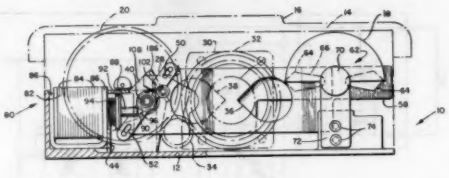
3,769,893

ELECTROMAGNETICALLY ACTUATED EXPOSURE CONTROL MECHANISM

Lawrence M. Douglas, South Easton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 21, 1972, Ser. No. 245,801
Int. Cl. G03b *9/42*
U.S. Cl. 95—53 EB **26 Claims**

An exposure control mechanism of a variety having two blades driven from a reciprocally pivotable walking beam. The mechanism is actuated by selectively energizing and de-energizing a solenoid having a plunger retractable within an excitation winding upon energization of the latter. The plunger is biased outwardly by a compression type opening spring providing an abuttable contact between the plunger tip and walking beam. A closing spring attached to the walking beam serves to bias the blades of the mechanism to move in a closing



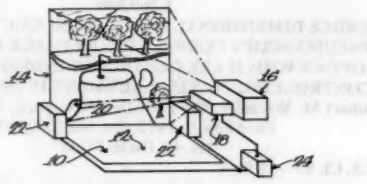
direction. Because the opening spring has a higher force value characteristic than the closing spring, the mechanism normally defines an open shutter condition. When the solenoid is energized, the plunger moves to compress the opening spring and negate its abuttable contact with the walking beam to permit the shutter to be closed under the isolated drive of the closing spring.

3,769,894

GOLF GAME

Robert M. Conklin, Muskegon, Mich., assignor to Brunswich Corporation, Skokie, Ill.

Division of Ser. No. 685,176, Nov. 22, 1967, Pat. No. 3,712,624. This application Aug. 24, 1970, Ser. No. 66,655
Int. Cl. G03b *15/00*
U.S. Cl. 95—85 **5 Claims**



A golf game for accurately and realistically displaying the results of golf shots to a golfer including a tee area whereat a golfer may hit a golf ball, a screen in front of the tee area, means for projecting on the screen any one of a plurality of scenes taken from different locations on a golf hole, data acquisition means associated with the tee for providing information relative to the trajectory of a ball hit from the tee by a golfer, a computer responsive to the data acquisition means for computing the trajectory of the ball, and ball spot projecting means responsive to the computer for projecting a spot of light on the screen and on the scenes displayed thereon to illustrate the trajectory of the ball to the golfer, the scenes being displayed to the golfer being of a golf course illustrating a flat playing surface so that the final location of the golf ball on the hole will be accurately and realistically indicated on the screen by the ball spot projecting means; and a method for providing the scenes.

3,769,895

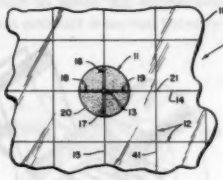
MASKING FOR PRINTED CIRCUIT PHOTOMASTERS

George J. Lucas, Norridge, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed June 9, 1971, Ser. No. 151,335
Int. Cl. G03b *15/00*
U.S. Cl. 95—85 **9 Claims**

A pad to represent a land area on a photomaster for printed circuit patterns has a set of orthogonal indicators to locate the

pad with respect to an underlying rectangular grid pattern. The pad also has a center mark to facilitate referencing to the



center of the pad for programming drills or the like once the pad has been incorporated into the pattern of the photomaster.

3,769,896

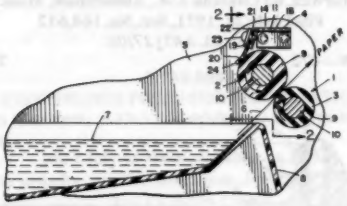
SQUEEGEE ASSEMBLY FOR PHOTO-COPY MACHINES

Abe Samuels, Chicago, and Roger A. Wiggerman, McHenry, both of Ill., assignors to Speed-O-Print Business Machine Corporation, Chicago, Ill.

Filed Aug. 16, 1971, Ser. No. 172,043

Int. Cl. G03d *3/10*

U.S. Cl. 95—89 A **6 Claims**



A wringer assembly, embodying engaging rollers, for use in feeding paper through photocopy machines, and having a moisture impervious, flexible wiper blade in yieldable wiping contact with one of the rollers for removing moisture therefrom. One of the rollers has a durometer hardness greater than that of the other roller, and the wiper blade has a durometer hardness less than that of the roller it contacts.

3,769,897

AUTOMATIC FILM PROCESSING MACHINE

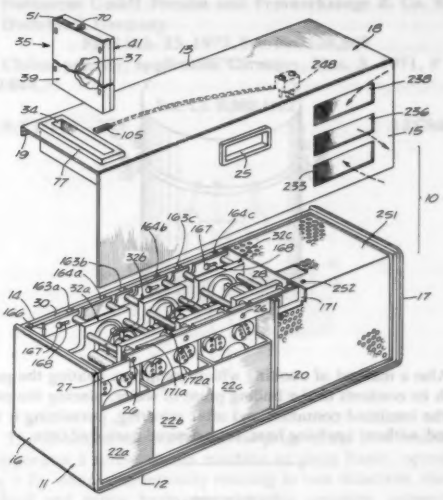
Ernst Zwettler, 2101 Hollister Ter., Glendale, Calif., and Siegmund E. Goebels, 1734 S. Barrington Ave., West Los Angeles, Calif.

Filed Jan. 27, 1972, Ser. No. 221,228

Int. Cl. G03d *3/12*

U.S. Cl. 95—94 R **10 Claims**

A portable automatic processing machine for developing exposed X-ray films by treating the film in successive tanks. The film is driven through the machine along a continuously curved path which directs the film down into each of the successive tanks and then through a drying chamber. A cassette enclosing the exposed X-ray film is provided which when inserted in an entrance slot on one end of the housing for the machine automatically provides for the film to be dropped into a film driving and guiding unit supported for immersion in the first tank. The film is then advanced into similar film driving and guiding units supported for immersion in each of the other tanks and then into a film driving and guiding unit disposed in a drying chamber which directs the fully developed film out of an exit slot on the other end of the housing. The film driving and guiding units interfit so that the curved path in each is aligned with the curved path of the following unit to thereby provide a continuously curved path for the film which extends throughout the machine. The film driv-



ing and guiding units are designed to be readily removable from the housing along with the tanks for the purpose of cleansing the equipment and replenishing the solution in the tanks.

3,769,898

DEVICE FOR AN AUTOMOBILE FOR SECURING VISIBILITY IN THE RAIN

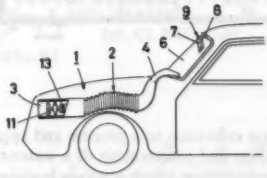
Takashi Ide, Motoichiba-11-1, Fuji-shi, Shizuoka-ken, Ruji, Japan

Filed July 9, 1971, Ser. No. 161,169

Claims priority, application Japan, July 13, 1970, 45/69152

Int. Cl. B60h *1/24*

U.S. Cl. 98—2 **7 Claims**



A device for an automobile for securing visibility, in which the rain drops coming in contact with the windshield of the automobile are scattered and removed by blasting across the windshield air drawn through the grill at the front end of the body of the automobile.

3,769,899

COOKING VESSEL

Nicholas M. Kostko, 3724 Raymond Ave., Brookfield, Ill.

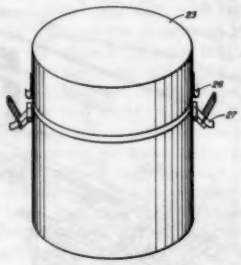
Filed Sept. 28, 1970, Ser. No. 76,198

Int. Cl. A47j *39/00*

U.S. Cl. 99—324 **1 Claim**

A thermally insulated cooking container which comprises outer insulator and an inner container of jacketed construction containing between the two walls of the jacket a material having a high heat coefficient. The inner container is covered

with a lid of similar construction to provide an air tight seal and an outer top of the same construction as the insulator which encompasses the inner lid and makes a tight fit with the insulator.



Also a method of cooking which comprises heating the pot with its contents to the boiling point of water, placing the pot in the insulated container and after covering, permitting it to stand, without applying heat, for a desired period of time.

3,769,900

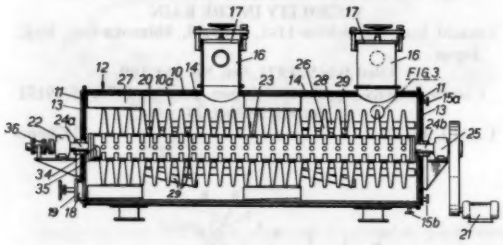
PROCESSING OF ANIMAL MATERIAL COMPOSITIONS

Thor Onarheim, Hop, and Per Solberg, Bergen, both of Norway, assignors to Stord Bartz Industry A/S, Bergen, Norway

Filed Apr. 21, 1971, Ser. No. 135,969

Int. Cl. B01f *7/02*

U.S. Cl. 99—348 **4 Claims**



The invention has reference to a process and apparatus for the batch sterilisation and evaporation of a water-containing animal material composition which involves leading the composition between an inner rotating heating surface and an outer stationary surface, the former representing a far larger proportion of the total heating area than the latter. After an initial heating, the composition has its passage arrested by rotating the inner surface in the reverse direction when substantial stirring is brought about and sterilisation and evaporation of the composition are effected. Finally, the composition which remains is expelled by rotating the inner heating surface in the original direction.

3,769,901

COOKER

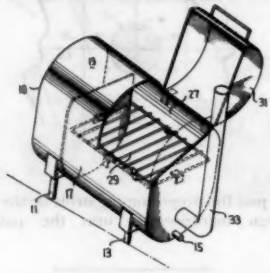
William E. Phillips, Rt. 1, Texico, Ill.

Filed Dec. 28, 1971, Ser. No. 212,971

Int. Cl. A47j *27/58, 37/07*

U.S. Cl. 99—444 **5 Claims**

A high degree of heat circulation is achieved in a cooker housing of generally elliptical cylindroid configuration, the longitudinal axis of the cylindroid disposed horizontally, the major axis of the ellipse disposed vertically. Heated gases from a firebox, located at one end of the housing, rise over a baffle, flow through a cooking region, and exhaust out through a flue



at the other end of the housing. The elliptical cross-section of the housing imparts a double spiral flow to the heated gases as they flow axially through the cooking region, thereby evenly distributing the heat to all parts of the food being cooked.

3,769,902

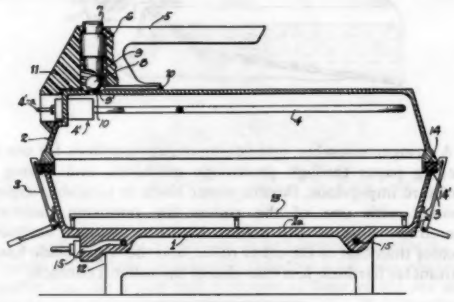
THAWER-COOKER

Mathew Hurwitz, 63 Oakland Ave., Auburndale, Mass.

Filed July 21, 1971, Ser. No. 164,612

Int. Cl. A47j *27/08*

U.S. Cl. 99—472 **7 Claims**



A vessel and process for cooking and/or thawing of foods utilizing heat transfer via direct-contact condensation of substantially air-free steam at sub-atmospheric (partial vacuum) pressures onto the food. A purge-venting means and method automatically flushes air from the vessel to initiate the partial vacuum and manual or automatically actuated valve means relieves the vacuum to terminate the process. Cooking and/or thawing takes place at controlled temperatures below the normal boiling point of water.

3,769,903

MEMBRANE SKINNING MACHINE

Charles Austin Greider, Des Moines, Iowa, assignor to Townsend Engineering Company, Des Moines, Iowa

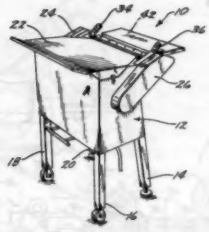
Filed May 20, 1971, Ser. No. 145,216

Int. Cl. A22c *7/12*

U.S. Cl. 99—589 **5 Claims**

A membrane skinning machine for severing the membrane from a meat product such as beef liver, beef tenderloin, etc. is disclosed herein. The machine includes a driven toothed roll

rotatably mounted on a frame means adjacent one end of a feed table and a pressure shoe which extends around a portion of the driven roll. A skinning blade extends from the pressure shoe and is adapted to sever the membrane from the meat product as the meat product is moved thereby. A stripping roll



is rotatably mounted on the frame means closely adjacent the driven roll for stripping the severed membrane from the driven roll after the membrane has passed between the driven roll and the pressure shoe. The stripping roll includes projecting spiral means on the periphery thereof which causes the severed membrane to dro or fall from the stripping roll.

3,769,904

CONTINUOUS PRESS FOR DEHYDRATION

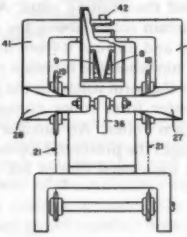
Ryutaro Yoritomi, 5-17-12 Koishikawa, Bunkyo-ku, Tokyo, Japan

Filed July 16, 1971, Ser. No. 163,394

Claims priority, application Japan, July 29, 1970, 45/65700

Int. Cl. B30b *3/04*

U.S. Cl. 100—158 C **12 Claims**



Two opposed, frustoconical rotary discs define a V-shaped annular channel therebetween in an annular casing of a press. A pair of shafts, each shaft rotatably supporting one of the discs, are pivotally connected together by a supported pin near the apex of the channel. The pin is supported across an opening formed in a plate fixedly disposed centrally in the casing. The shafts extend outwardly through the casing and are fixed to respective supporting yokes, each yoke having two free ends. One of the free ends of one yoke is pivotally connected to a corresponding free end of the other yoke on the axial line of the pin. The remaining two ends of the yokes are adjustably connected together along the plane in which the shafts lie and these ends may be drawn together to selectively vary the shafts' directions to thereby adjust the width of the V-shaped channel.

3,769,905

SCREW PRESS

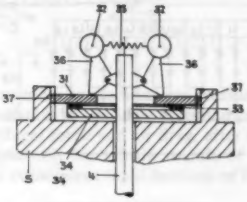
Helmut Dishcler, Neub-Udesheim, Germany, assignor to Novopress GmbH Pressen und Preswerkzeuge & Co. KG, Dusseldorf, Germany

Filed Feb. 23, 1972, Ser. No. 228,568

Claims priority, application Germany, Mar. 3, 1971, P 21 10 044.7

Int. Cl. B30b *1/22*

U.S. Cl. 100—289 **12 Claims**



The invention relates to a screw press of the kind which incorporates a screw, in the machine or press frame, operated by a fly wheel continuously rotating in one direction, the fly wheel and screw having a releasable coupling connecting them the coupling being released on the attainment of a predetermined pressing effect. The invention is particularly concerned with the release of the coupling and provides a press wherein the release of the coupling is effected to remove as much energy as possible from the fly wheel before the uncoupling is effected the construction being such that the release takes place on the falling below of a predetermined angular velocity and/or the exceeding of predetermined angular retardation of the screw.

3,769,906

INSTALLATIONS FOR PRINTING CODES ON ARTICLES

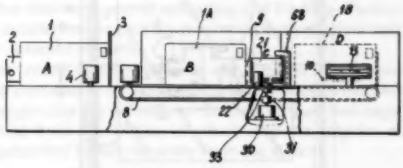
Claude R. Martin, Maisons Laffitte, France, assignor to Societe D'Etude et de Construction D'Appareils de Precision, Boulogne-Billancourt, France

Filed Jan. 11, 1972, Ser. No. 216,980

Claims priority, application France, Jan. 11, 1971, 7100620; Dec. 2, 1971, 7143217

Int. Cl. B41j *7/20*

U.S. Cl. 101—91 **21 Claims**



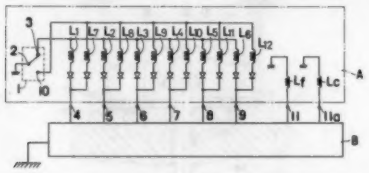
A code printer comprising a reading position with a coding keyboard preceded by a feeder magazine for articles to be code-printed, and a printing position followed by a discharging position and a position for stacking the code-printed articles, the printing position incorporating a printing cylinder or drum carrying retractable printing characters, driving means for rotating the printing cylinder, selector means for putting the retractable characters in either a working or an idling position and an electronic control system associated with storage means for receiving coding pulses by activation of appropriate keys on the keyboard and releasing the selector means and driving means for impressing the code on the article.

3,769,907

PRINTING DEVICE FOR SELECTIVELY PRINTING DIFFERENT GROUPS OF FIGURES

Masaaki Oishi, Tokyo; Yoshinaga Takahashi, Yachiyo-shi, and Keiichi Yoshizawa, Matsudo-shi, all of Japan, assignors to Kabushiki Kaisha Hattori Tokeiten, Tokyo, Japan

Filed July 23, 1971, Ser. No. 165,045
Claims priority, application Japan, July 24, 1970, 45/64461
Int. Cl. B41j *5/44*
U.S. Cl. 101—93 C **8 Claims**



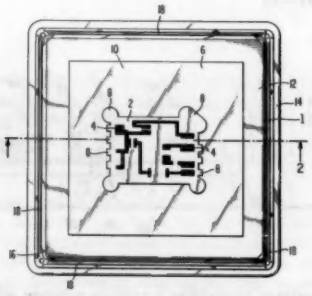
A printing device for electronic computors and the like comprises a printer drive circuit including a first group of printing coils for effecting printing of lower place figures and a second group of printing coils for effecting printing of higher place figures, and a switching mechanism for selectively switching print command signals to one of the first and second printing coil groups. The printing device includes means for selectively performing either a single printing operation with the energization of the lower place figure printing coils or two consecutive printing operations consisting of a first printing operation with the energization of the lower place figure printing coils and a second printing operation with the energization of the higher place figure printing coils by actuating the switching mechanism in accordance with a drive command signal.

3,769,908

METAL MASK SCREEN FOR SCREEN-PRINTING

Patrick Joseph Griffin, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 28, 1972, Ser. No. 284,075
Int. Cl. B41n *1/24*
U.S. Cl. 101—127 **3 Claims**



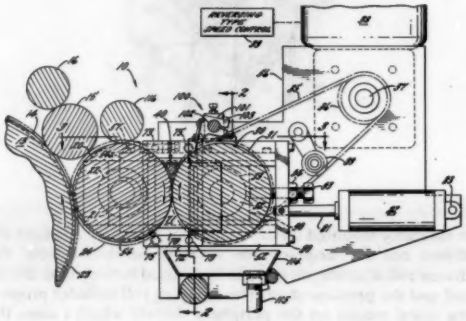
A printing screen comprises a fine metal mesh stretched across a printing frame. A central printing area of the screen has a layer of metal integrally united with the mesh. This central metal layer has a pattern of openings therein corresponding to a pattern which is to be printed on a substrate and outwardly extending tabs at points of stress. An annular region of the mesh surrounding the central metal layer is free of any metal layer but has a thin masking layer of synthetic resin thereon. A border layer of metal on the mesh extends around the outer periphery of the screen.

3,769,909

WET NIP DAMPENER

Robert L. Fugman, Chicago, and Leslie J. Jezuit, Lyons, both of Ill., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Mar. 10, 1971, Ser. No. 122,965
Int. Cl. B41l *25/00;* **B41f** *1/46*
U.S. Cl. 101—148 **1 Claim**



A dampening arrangement for a lithograph press which includes a fountain roller and a resilient water form roller arranged side by side with dams bridging the ends thereof to form a reservoir of water along the nip between the rollers. The form roller is rotated at press speed and in such direction that a continuously reformed, uniform film of water is transferred directly from the nip to the surface of the printing plate. Means are provided for varying the pressure between the rollers and for controlling the direction and speed of rotation of the fountain roller to control the thickness of the film. The rollers are mounted on a subframe which is supported on horizontal ways, with an actuator for pressing the subframe against stops which are adjustable to control the "squeeze" of the form roller against the printing plate. A scraper blade is provided on the fountain roller above the nip to retain the water in the reservoir and prevent it from traveling around to the lower side of the nip when the fountain roller is rotated in the same direction as the form roller. In the preferred form of the invention the water form roller engages the plate just ahead of the ink form roller. An auxiliary, self-oscillating roller preferably engages the presented top surface of the form roller to smooth out the casual film of ink picked up by the water form roller.

3,769,910

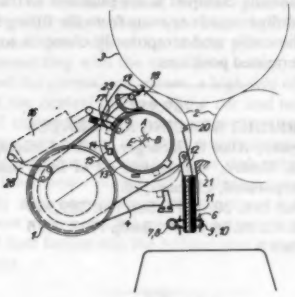
MOVABLY POSITIONABLE CYLINDER ARRANGEMENT FOR INDIRECT PRINTING PRESSES

Paul Heimlicher, Bolligen, and Hans Streit, Lauperswil, both of Switzerland, assignors to Maschinenfabrik Winkler, Fallert & Co. AG, Berne, Switzerland

Continuation-in-part of Ser. No. 853,303, Aug. 27, 1969, abandoned. This application Mar. 12, 1972, Ser. No. 234,269
Claims priority, application Sweden, Sept. 2, 1968, 6811790
Int. Cl. B41f *5/12, 5/16, 13/34*
U.S. Cl. 101—177 **5 Claims**

A cylinder arrangement for offset and similar printing presses which permits printing on one or both sides. A rubber cylinder is rotatably supported at its ends in eccentric bushings and the bushings are rotatably mounted within pivotally displaceable side plates. By pivoting the side plates,

the rubber cylinder can be positioned for printing on one or both sides. In addition, the eccentric bushings can be rotated



for moving the rubber cylinder between an operative and an inoperative position when the rubber cylinder is arranged for printing on one or on both sides.

3,769,911

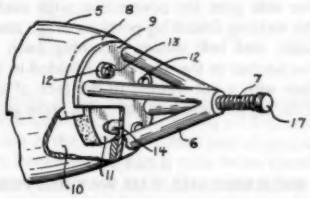
CONTACT FUSE

Glenn O. Folkins, Placitas, N. Mex., assignor to The United States of America as represented by the United States Atomic Energy Commision, Washington, D.C.

Filed Dec. 14, 1971, Ser. No. 207,736

Int. Cl. F42c *1/14*

U.S. Cl. 102—7.4 **2 Claims**



The contact fuse of a parachute restrained ordinance device is provided with various means for insuring detonation at ground level. Series connected crush switches externally mounted on the nose of the ordinance device activate the firing circuits when contact is made with soft ground. A cruciform-shaped open guard member both prevents switch contact with the forest canopy and permits actuation by soft ground surface. An internally disposed crush switch placed between a fixed position foam pad member and a face plate mounted on a sheat joint member activates the firing circuits while preventing premature fuse wipe-out when solid ground is contacted. A jettisonable cover cone prevents premature detonation while the ordinance device is being carried by an aircraft.

3,769,912

SPIN-STABILIZED PROJECTILES

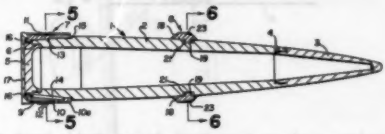
William Harold Friend, 1554 Boucherville Blvd., St. Brun, Quebec, Canada

Filed Oct. 23, 1970, Ser. No. 83,584

Int. Cl. F42b *31/00*

U.S. Cl. 102—93 **8 Claims**

A projectile assembly includes a spin-stabilized projectile having a sub-calibre portion and a discardable sabot mounted on the sub-calibre portion. The sabot is connected to the projectile in such a manner as to prevent separation of the sabot from the projectile, while the rear end of the projectile assembly remains in the barrel of a gun bore from which the projectile assembly is fired, by reason of the axial force exerted on



the projectile assembly by the firing gas pressure. The connection allows separation of the sabot from the projectile by the action of centrifugal force and air drag, after the rear end of the projectile assembly has left the muzzle of the gun barrel, by reason of the consequent rapid decrease of the axial force.

3,769,913

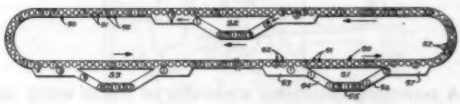
HIGH MASS FLOW TRANSPORTATION SYSTEM

William V. McRae, Jr., Anaheim, and John J. Stuart, Jr., Newport Beach, both of Calif., assignors to Transyt Corporation, Newport Beach, Calif.

Continuation-in-part of Ser. No. 765,550, Oct. 7, 1968, abandoned. This application Sept. 30, 1971, Ser. No. 185,126

Int. Cl. B61k *1/00*

U.S. Cl. 104—88 **15 Claims**



A high mass flow transportation system wherein one or several interconnecting track loops guide corresponding endless chains of car carriers past a series of fixed stations; each carrier being adapted to receive a removable passenger car, there being distributed sets of carriers in each chain precoded to receive only those cars destined for delivery to corresponding stations; and further, each station includes conveyors which remove and decelerate passenger cars destined for that station to permit unloading and loading of passengers, then accelerate the cars for return to empty carriers coded for other selected stations.

The transportation system is also capable of accomodating cargo containers, or passenger vehicles interspersed with the passenger cars for delivery to selected stations and capable of removal from the system, in which case the vehicles may be self-propelled for use separate from the system.

3,769,914

SPEED SYNCHRONIZING CONTROL ARRANGEMENT FOR TRANSPORT SYSTEMS

Jean-Paul Philippe Lorinet, Grenoble; Francois Lagier, Seyssinet, and Bernard Bobineau, Grenoble, all of France, assignors to Marlin Gerin, Societe Anonyme, Grenoble, France

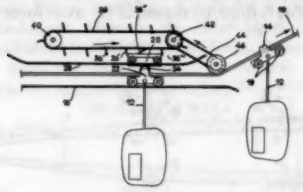
Filed Nov. 29, 1971, Ser. No. 202,824

Int. Cl. B61k *1/00*

U.S. Cl. 104—148 LM **10 Claims**

An automatic control arrangement for synchronizing the speed of a linear induction motor-driven vehicle with the

speed of an independently driven body, such as a movable arrival or departure platform. A unidirectional clutch



mechanism, such as freewheel device, holds back the accelerating vehicle as soon as it has reached the speed of the platform.

3,769,915

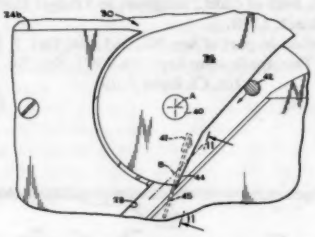
SWITCHING APPARATUS

Horace M. Swartz, Doylestown, Pa., assignor to FMC Corporation, San Jose, Calif.

Filed Jan. 27, 1972, Ser. No. 221,221

Int. Cl. B65g *17/44*; **B61g** *3/04*

U.S. Cl. 104—172 BT **8 Claims**



A conveying system has a plurality of trucks which are towed about an area by a chain beneath the surface of the floor. The floor has slots through which a tow pin on the truck depends for engagement with the chain. Switch plates in the floor are movable to permit diversion of a truck from an upstream slot to a selected one of two downstream slots. A resilient member on the downstream side of the switch plate extends into the path of a tow pin traveling past the switch plate in the selected downstream slot. Engagement of the resilient switch member by the tow pin urges the switch plate into the opposite position to connect the upstream slot with the other downstream slot.

3,769,916

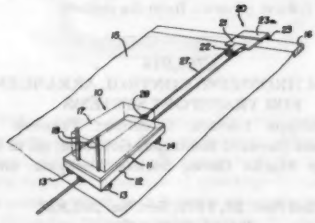
ROOFING SHINGLE DOLLY

John R. Hogan, East Detroit, Mich.

Filed Sept. 12, 1972, Ser. No. 288,366

Int. Cl. B61b *7/00*; **E04b** *7/18*

U.S. Cl. 104—173 R **4 Claims**



A roofing shingle dolly, for positioning piles of shingles upon predetermined locations on a sloped roof, formed of a shingle support platform mounted upon casters for rolling up and down a sloped roof surface, and an adjustable, V-shaped fitting for engaging over and securing to the roof ridge, with a cable connecting the platform to the fitting and being releasably frictionally clamped to the platform so that a roofer may move the dolly towards or away from the fitting by pulling or loosening the cable and temporarily clamp it to hold the dolly in predetermined positions.

3,769,917

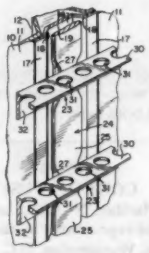
FREIGHT BRACING APPARATUS

Richard C. Snyder; Alan F. Krueger, both of Michigan City, and Henry E. Steder, Valparaiso, all of Ind., assignors to Pullman Incorporated, Chicago, Ill.

Filed Dec. 20, 1971, Ser. No. 209,917

Int. Cl. B61d *45/00*; **B60p** *7/08*, *7/16*

U.S. Cl. 105—369 B **5 Claims**



In a freight car compartment, load bracing means in the combined form of removable belt rails horizontally and longitudinally mounted on a plurality of upright recessed lading strap anchors, each lading strap anchor being a vertically extending bar, a U-shaped strap guide member recessed within a respective side post for connection with each lading strap anchor by welding folded leg portions of the anchor bar to the strap guide, and bolt means attaching each belt rail to a respective anchor in the area of the folded-in leg portions of the anchor with a nut welded to the face of the anchor bar between the leg portions and facing the strap guide.

3,769,918

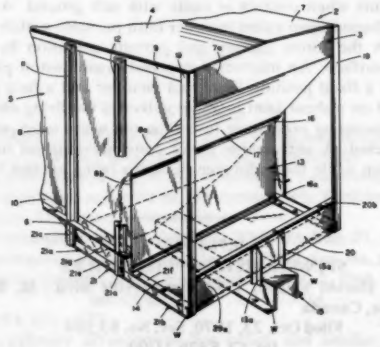
HIGH SIDE SILL RAILWAY HOPPER CAR

Phillip G. Przyblinski, Schererville, Ind., and Joe B. Raidt, Calumet City, Ill., assignors to Pullman Incorporated, Chicago, Ill.

Filed Sept. 15, 1971, Ser. No. 180,600

Int. Cl. B61d *5/00*, *7/00*, *17/06*

U.S. Cl. 105—248 **8 Claims**



In a center sill-less railroad hopper car, a pair of opposed end portions and a central hopper portion having opposed

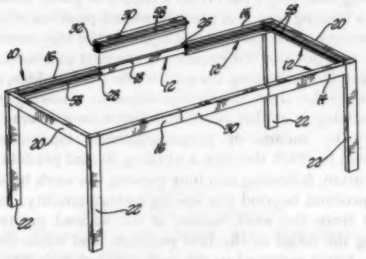
slope sheets, each end portion having a stub center sill mounted to the underside of a flat horizontal shear plate and a bolster web beam mounted on the shear plate and attached to the respective slope sheet, and corner post means spaced outwardly of the bolster means, bolster post means in lateral alignment with the bolster web beam and inner side post means spaced inwardly of the bolster post means, side girder means connecting with the inner post means, the bolster post means and the corner post means, a high side sill extending the length of the central portion of the car and into the end portions and connecting with each respective inner post means and bolster post means, and skirt means depending from each outer end construction and having a stub side sill connecting with the lower inner portion of the skirt means and extending outwardly and connecting with the inner post means, the bolster post means and the corner post means for transmitting draft and buff forces into the bolster post means and the inner post means.

3,769,919

EXTENSIBLE TABLE

Paul P. Thomas, Bryan, Ohio, assignor to Winzeler Stamping Company, Montpelier, Ohio

Filed June 23, 1972, Ser. No. 265,892
Int. Cl. A47b *1/08*
U.S. Cl. 108—83 **8 Claims**



A table assembly which may be repeatedly manufactured with identical components, but which may be sold in different lengths. Each side of the table includes a pair of spaced female beam members interconnected by a male beam member having its opposite ends disposed within the opposed female beam members. The male and female beam members are four sided and there are a set of four pads disposed at each end of the male beam member and a set of four pads disposed at the distal ends of the female members for supporting the male beam member centrally within the female beam members and so that the male beam member may slide relative to the female beam members. Associated with each set of four pads is a pair of spaced plates having notches in opposite extremities thereof so that a pair of the pads have their ends disposed in the notches whereas the remaining two pads are supported by the plates themselves. If the customer desires the table to be of an extended length, the female beam members are pulled apart to expose the interconnecting male beam members and a cover member is disposed over the exposed portion of the male beam members. The table also includes a flange means secured to the beam members for supporting a table top.

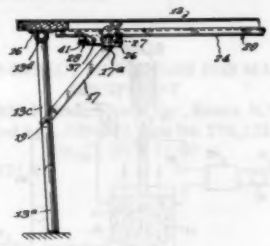
3,769,920

FOLDING TABLE LEG LOCKING DEVICE

Samuel Herman Weiss, 2800 W. Albion, Chicago, Ill.

Filed Aug. 9, 1971, Ser. No. 169,926
Int. Cl. A47b *3/08*
U.S. Cl. 108—133 **1 Claim**

A folding table leg locking device, for use in securing a table leg rail follower at a fixed position along a horizontally-extending flanged, channel-shaped rail on the underside of a folding table. The device is provided with a spring loaded catch having at least two tongues of unequal length supported on a support pin by brackets formed integrally from the



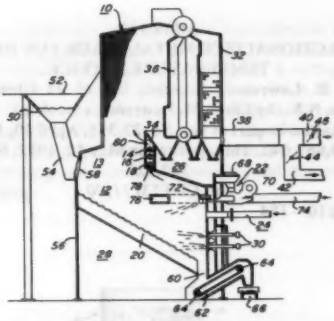
flanges of the channel rail. The brackets including ears for distributing locking impact forces along the rail follower.

3,769,921

WASTE MATERIALS PROCESSING SYSTEM

Frederick G. McMullen, Gwynedd Valley, Pa.

Filed Dec. 27, 1971, Ser. No. 212,270
Int. Cl. F23g *5/00*
U.S. Cl. 110—8 R **26 Claims**



A waste materials processing system and method for combusting solid waste material on grates in combination with comminuted waste material being combusted in suspension within a combustion zone. Conduits are positioned external to the combustion zone around which exhaust gases from the combustion zone pass. Comminuted waste material is driven through the conduits and by pyrolytic action emit gases which are collected and passed to a recovery system. Additionally, pre-dried sludge and sludge vapors derived from sanitary sewage are incorporated into the combustion zone for burning. The combined waste materials processing system may be incorporated within a steam generating system in order to increase the overall efficiency of the boiler.

3,769,922

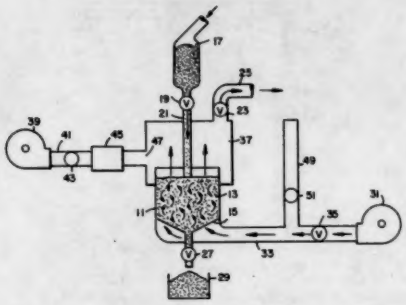
FLUID BED REACTOR PRE-HEATING METHOD AND APPARATUS

Dale A. Furlong, and Alan H. Schmid, both of Sunnyvale, Calif., assignors to Combustion Power Inc., Menlo Park, Calif.

Filed Dec. 30, 1971, Ser. No. 213,962
Int. Cl. F23d *19/00*
U.S. Cl. 110—28 J **4 Claims**

A quantity of finely divided inert particles is fluidized by a high velocity stream of cold air directed against the particles

from the bottom while waste material is fed into the fluidized particles from the top. The particles are initially pre-heated to



a temperature sufficient to cause combustion of the waste material by passing a low velocity stream of hot air through the volume of particles from its top to its bottom.

3,769,923

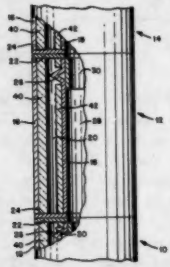
SECTIONALIZED METAL STACK FOR HIGH TEMPERATURE SERVICE

Richard E. Lawrence, deceased, late of 22 Glenwood Rd., Roslyn, N.Y. (by Eileen M. Lawrence, executrix)

Continuation-in-part of Ser. No. 27,355, April 10, 1970, Pat. No. 3,669,042. This application May 12, 1972, Ser. No. 252,927

Int. Cl. F23j *11/00*

U.S. Cl. 110—184 **9 Claims**



A steel stack for conveying hot gases consists of vertical sections which each have a tubular, upright, inner wall, a tubular, upright, outer wall spacedly surrounding the inner wall, an upper annular flange and a lower annular flange which connect the walls so as to form a sealed chamber about the inner wall. The bore of the inner wall provides a gas conduit alignedly communicating with corresponding conduits of other sections. Gas in the chamber holds heat transfer by conduction from the inner to the outer wall to a minimum. The operating temperatures are too low to cause significant heat radiation from the inner wall, and heat loss from the inner wall by convection is reduced or avoided by a layer of thermal insulation, such as glass wool, at least partly covering one of the walls in the chamber.

3,769,924

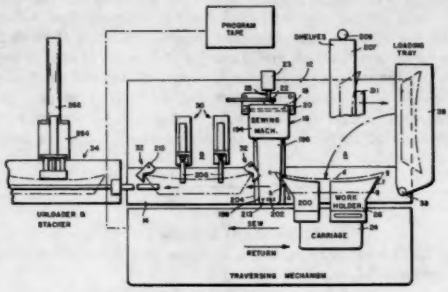
PROFILE SEWING APPARATUS

William H. Rogers, 9 Wenda Street, Reading, and Evald O. Peterson, 11 Priscilla Road, Lynnfield Center, both of Mass.

Filed Mar. 10, 1972, Ser. No. 233,566

Int. Cl. D05b *33/00*

U.S. Cl. 112—121.29 **24 Claims**



A method and apparatus for sewing a line of stitching of predetermined configuration on a part or assembly of parts comprising selecting a part from a supply of parts, mounting a part on a loading tray in a predetermined position of orientation by means of end and edge gauges on the tray, moving the tray to a first position for presenting the part to a work holder at that position, clamping the part to the work holder, moving the work holder from the first position to a sewing position and traversing it at that position relative to a sewing instrumentality by means of preprogrammed tape controlled mechanism to stitch the part according to said predetermined configuration, following stitching moving the work holder to a second position beyond the sewing instrumentality, releasing the part from the work holder at the second position and returning the latter to the first position, and while the work holder is being returned to the first position withdrawing the part from the second position for stacking of successive parts. The loader is reloaded while the work holder is traversing the part at the sewing position and optionally the part is trimmed at the second position prior to being withdrawn for stacking.

3,769,925

LOOP TAKER LUBRICATION FOR SEWING MACHINES

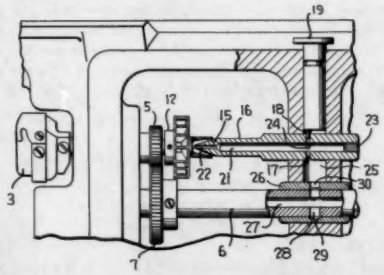
Wolf-Rudiger Von Hagen, Grotzingen, Germany, assignor to Union Special Maschinen fabrik G.m.b.H., Stuttgart, Germany

Filed Nov. 12, 1971, Ser. No. 198,377

Claims priority, application Germany, Nov. 25, 1970, P 20 57 916.2

Int. Cl. D05b *71/00*

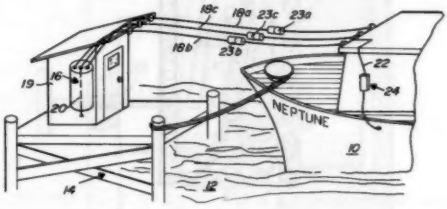
U.S. Cl. 112—256 **10 Claims**



Apparatus for lubricating a loop taker raceway in a sewing machine wherein a current of air forces an oil mist through a

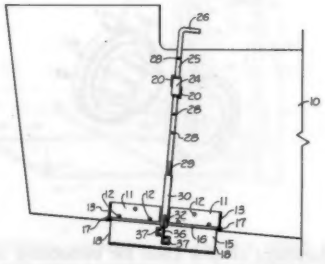
hollow loop taker drive shaft and deflects the air laterally at the inlet port of the shaft, and wherein the oil is positively supplied with the quantity of supply of oil varying in accordance with the r.p.m. of the sewing machine.

3,769,926
MARINE GALVANIC CONTROL CIRCUIT
Richard T. Race, Chicago, Ill., assignor to Motorola, Inc., Franklin Park, Ill.
Filed Oct. 18, 1971, Ser. No. 189,861
Int. Cl. H01b *7/28*
U.S. Cl. 114—.5 R **10 Claims**



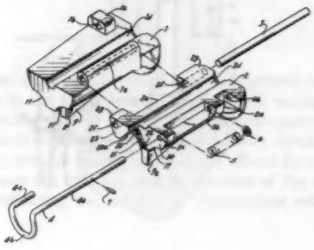
Apparatus for minimizing galvanic deterioration of the metallic hull of a ship moored at a dock of a dissimilar metal, and receiving electrical power from a power source grounded at the dock, includes a plurality of silicon diodes connected to an electrical power conductor grounded at the dock and at the metallic hull of the ship. The intrinsic junction voltage drop of the diodes is sufficient to block current flow due to the voltaic cell effect between the ship's hull and dock.

3,769,927
TRIM TABS FOR BOATS
Charles R. Carney, Corpus Christi, Tex., assignor to Charles R. Carney, Corpus Christi, Tex.
Filed July 5, 1972, Ser. No. 269,261
Int. Cl. B63b *1/22*
U.S. Cl. 114—66.5 P **5 Claims**



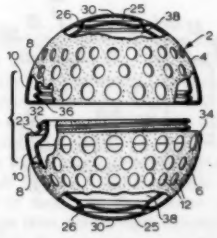
Boat stabilizing apparatus having a pair of independently adjustable rigid trim tab plates mounted on the stern on opposite sides of the longitudinal center line of the boat. A pivot rod is fastened along one longitudinal edge of each plate with its ends projecting beyond the ends of the plate. A pair of brackets, each of which has a perpendicular ear at one end, and has an opening for a pivot rod end, to mount the pivot rod to turn about a horizontal axis adjacent the stern. The plate is angularly adjustable about this axis by rotation of an adjusting rod mounted to rotate about its axis in and held against endwise movement relative to a sleeve, which is pivotally connected with a bracket mounted on the stern. The adjusting rod has threads engaging internal threads in a tubular member that has a longitudinally slotted end pivotally connected with the flat upstanding body portion of a bracket mounted on the plate. All the brackets are made of suitable guage sheet metal. The adjusting rod has spaced grooves for snap rings for adjusting it lengthwise in the sleeve.

3,769,928
HINGED IMPACT MESSENGER FOR MARINE EQUIPMENT
Joseph Kahl, 3850 Hudson Manor Ter., Bronx, N.Y.
Filed Aug. 30, 1971, Ser. No. 176,122
Int. Cl. B63c *1/00*
U.S. Cl. 114—221 R **11 Claims**



An impact messenger for submerged apparatus has an open condition for being placed on a guide wire in a closed condition for downward travel along the guide wire. A spring loaded locking pin locks the device in the closed condition and has an arresting pin portion protected by a shoulder and prevented from slipping off by the inner edge of one fin of two diametrical fins. The fins and grooves in the outer surface of the device facilitate handling and increase the stability and descent speed during the drop.

3,769,929
RECREATIONAL DEVICE
George D. Scheber, 14409 Irving Ave., Orland Park, Ill.
Filed Oct. 26, 1972, Ser. No. 300,894
Int. Cl. B60f *3/00*
U.S. Cl. 115—1 R **10 Claims**



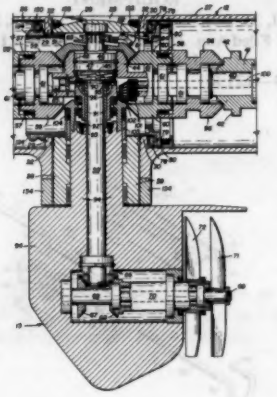
A spherical cage device for aquatic or land use comprising two independent, inflatable semi-spherical, foraminous sections which have interlocking elements automatically disengageable upon deflation of either section. Each section has a hollow person-accommodating interior and each section is self-sustaining and can be manually attached or detached with respect to the other section.

3,769,930

INBOARD-OUTBOARD DRIVE MECHANISM FOR BOATS

Lyle C. Pinkerton, Henderson, Colo.

Filed May 3, 1971, Ser. No. 139,562
Int. Cl. B63h *1/14, 51/10, 25/42*
U.S. Cl. 115—35 20 Claims



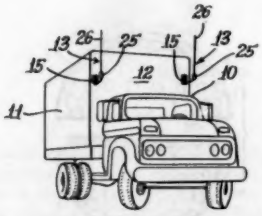
An all gear drive mechanism for boats comprising a train of gears loosely mounted on a horizontal idler shaft mounted at opposite ends in a stationary housing for transmitting power from one or each of two engines to a vertical drive shaft operatively connected to propellers mounted in a lower housing rotatable relatively to the stationary housing by steering mechanism controlled by a steering wheel. The idler shaft has an opening extending transversely therethrough, surrounded by an extrusion in the form of a collar perpendicular to the axis of the idler shaft, and the vertical drive shaft extends through said opening and collar and is supported by the idler shaft.

3,769,931

LOW OVERHEAD WARNING DEVICE

John S. Babut, 2242 North Southport Ave., Chicago, and Stanley J. Morek, 1302 Spring Beach Rd., Cary, both of Ill.

Filed Jan. 3, 1972, Ser. No. 214,544
Int. Cl. B60q
U.S. Cl. 116—28 R 3 Claims



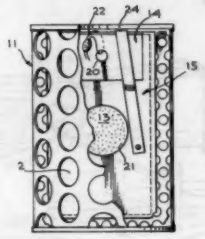
At one side of the front of a truck body a mounting plate is affixed to the body and spaced therefrom. A one-quarter inch steel rod has its proximal end secured to the plate. The rod angles upwardly and forwardly above the truck cab. The distal end of the rod is vertically upward and supports a steel wire feeler which extends to an elevation above the top of the truck body. A corresponding construction is affixed to the other side of the front of the truck body.

3,769,932

DUMMY CAN VEHICLE FOR AN INDICATOR DEVICE IN CANNED GOODS STERILIZING OR COOKING OPERATIONS

Vincent A. Romito, North Hollywood, and Arthur W. Hanna, Sunland, both of Calif., assignors to Sterilizer Control Royalties (a Trust), North Hollywood, Calif.

Filed Jan. 14, 1972, Ser. No. 217,865
Int. Cl. G01d *21/00*
U.S. Cl. 116—114 V 11 Claims



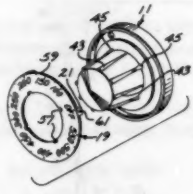
A dummy can vehicle for an indicator device for use in sterilizing or cooking operations in the canning industry, by which the heat treatment of the filled cans may be registered for inspection at the end of such treatment. The indicator device is specifically a color-change ink spot or marking on a card placed in a pocket-like container within said dummy can vehicle, which card may be viewed in the dummy can, and subsequently retained as a record of said can processing.

3,769,933

REPLACEMENT CONTROL KNOB

Donnell H. Fox, Huntington Beach, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Aug. 22, 1972, Ser. No. 282,680
Int. Cl. G05g *1/10*
U.S. Cl. 116—124.2 A 13 Claims



A replacement control knob for installation on first and second controls having rotary control stems formed with respective index elements disposed at respective first and second relative rotational positions with respect to respective indicators included on such controls. The knob includes a body formed with a passage for receipt of such stems and including an index key cooperating with the index element to index rotational positioning of the body on such stem. The body is formed with a dial mount and a removable dial is received thereon and is shiftable to first and second clocked positions corresponding with the first and second relative rotational positions of the index elements with respect to the indicators. Retainer means is included on the dial for retaining it on the body in the selected first or second clocked position. Thus, by merely selecting the desired clocked position for the dial as it is mounted on the body, the assembled knob may be utilized interchangeably on either the first or second controls.

3,769,934

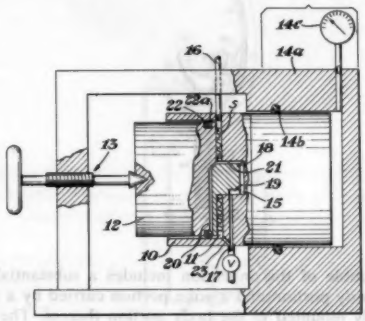
SAMPLE PREPARING APPARATUS

James L. Dunn, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 99,240, Dec. 17, 1970, abandoned, which is a division of Ser. No. 868,347, Oct. 22, 1969, abandoned. This application Jan. 26, 1973, Ser. No. 326,610

Int. Cl. B05 *11/02*

U.S. Cl. 118—121 1 Claim



An apparatus for impregnating samples consisting of a sample cavity, a closure for the cavity, fluid ducts for introducing solutions of chemicals and for draining the excess of the solutions, a means for developing pressure within the cavity and a pressure measuring means.

3,769,935

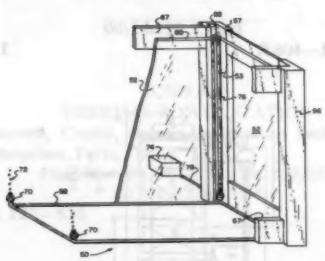
NON-CORROSIVE AQUARIUM CONSTRUCTION AND METHOD

Boyd R. Johnson, 2034 Ashton Cir., Salt Lake City, Utah

Filed Aug. 1, 1972, Ser. No. 276,994

Int. Cl. A01k *63/00*

U.S. Cl. 119—5 17 Claims



A non-corrosive aquarium and method which makes it possible for salt water aquarium life to be exhibited and maintained in a near natural environment. The aquarium, in addition to maintaining a salt water environment, is also constructed in a manner which makes it complementary with home or office decor. The aquarium is sealed with an adhesive sealant and a supporting molding is bonded to the corners to provide support to the side surfaces. The molding bonded to at least one corner contains a conduit channel which allows wires or air tubing to be invisibly conducted along the outside of the container to the top. The method of operation includes a method for circulating the water to achieve a high filtering efficiency by air displacement of water at opposed corners of the aquarium. The air displacement in aquariums having selected dimensions produces harmonic fluid flow to maintain the aquarium life in an envigorating environment necessary to the survival of salt water fish.

3,769,936

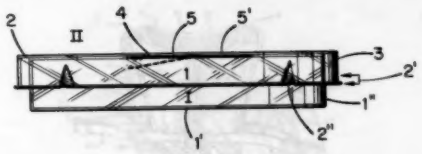
ORGANISM GROWTH CHAMBER AND PROCESS

H. Damon Swanson, and Glenda A. Swanson, both of Star Rt. 78, Plastow, N.H.

Filed Aug. 9, 1971, Ser. No. 170,252

Int. Cl. A01k *01/00*; C12k *01/10*

U.S. Cl. 119—15 6 Claims



This disclosure deals with a novel organism growth chamber for such uses as the observation of *Drosophila melanogaster* genetic studies and the like embodying a flat transparent cover for a Petri-type dish provided with an externally communicating orifice that may be readily opened and closed for communication between the exterior and the interior of the covered dish without affecting the activity or observation within the same.

3,769,937

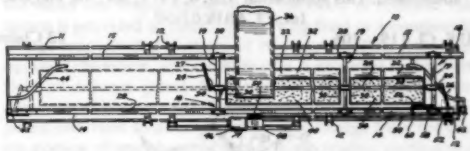
BUNK FEEDER

Joseph N. Kenning, St. Cloud, Minn., assignor to Donald B. Voigt, St. Cloud, Minn., a part interest

Filed May 2, 1972, Ser. No. 249,623

Int. Cl. A01k *5/02*

U.S. Cl. 119—52 B 10 Claims



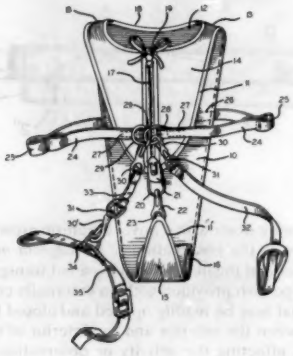
A trough is shaped to receive and carry animal feed on both sides thereof. It is supported for reciprocating movement along a feed bunker twice its length and passes back and forth under a feed discharge chute above and near the center of the feed bunker. The chute deposits feed on whichever side of the trough is uppermost on a particular pass. When an end of the trough reaches a far end of the bunker, the top side of the trough will be full of feed, and the trough will be inverted, dumping a load of feed into the bunker under the entire trough. The trough then moves back toward the other end of the bunker, receiving feed on what was until the inversion, the bottom side of the trough. When the opposite far end of the bunker is reached, the entire trough will have been loaded with feed and it will again be inverted, dropping feed in the entire remaining half of the bunker. As the trough again moves along over the bunker, it fills again and when the end is reached is unloaded again. A fractional portion of the bunker, can be serviced by shortening the length of travel of the trough in each direction before it is inverted.

3,769,938

SAFETY SUPPORT FOR BABIES

Josephine M. Hudziak, 2115 S. 35th St., Milwaukee, Wis., and Mary L. Bernau, 5666 S. Honey Creek Dr., Milwaukee, Wis.

Filed Dec. 13, 1971, Ser. No. 207,065
Int. Cl. A01k *29/00*; A62b *01/16, 35/00*
U.S. Cl. 119—96 4 Claims



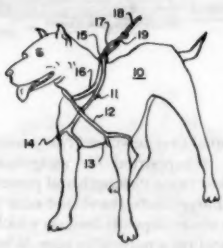
A garment for infants or babies leaves the arms and legs free and yet leash-like members attach the garment to a nearby object and prevents the infant or baby from crawling away.

3,769,939

RESTRAINING AND TRAINING HARNESSING DEVICE

Lowell Wais, and Charles C. Milbourne, both of Chicago, Ill., assignors to Harnex Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 107,236, Jan. 18, 1971, abandoned. This application Aug. 4, 1971, Ser. No. 168,805
Int. Cl. A01k *03/00*
U.S. Cl. 119—106 13 Claims



Restraining and training harnessing devices for pet animals, such as dogs, comprising one or more segments of flexible cord adapted for positioning in a cross-wise pattern across the animal's chest with cord portions extending along the animal's nech on both sides thereof and through one or more collar rings. The devices are provided with loop elements, associated with the cord, for encircling the upper portions of the animal's forelegs. Operatively, pulling forces applied on the harnessing device tend to draw the forelegs together and effect temporary inhibition of further attempts at movement of the animal.

3,769,940

ANIMAL HOBBLE

Guy Jansen-Vanbeek, Rt. 1, Caldwell, Idaho, and John Jansen-Vanbeek, Rt. 1, Fruitland, Idaho

Filed Jan. 24, 1972, Ser. No. 219,983
Int. Cl. A01k *15/00*; B68b *01/14*
U.S. Cl. 119—126 1 Claim

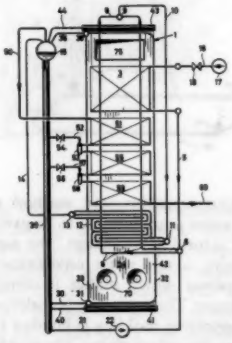
The hobble of this invention includes a substantially C-shaped body portion and a yoke portion carried by a shank threadably mounted in the body portion thereof. The yoke portion of the hobble is engageable with the rear tendon of an animal's hind leg, while the body portion is engageable with the front portion of the leg. The yoke portion is rotatably mounted by means of a screw and cooperating annular slot on the shank so that the yoke may remain stationary during rotation of the shank, the shank being operable to move the yoke portion inwardly and outwardly within the body portion in response to rotation of the shank.

3,769,941

STEAM GENERATOR

Richard Joseph Dolezal, Winterthur, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed Dec. 21, 1971, Ser. No. 210,496
Claims priority, application Switzerland, Dec. 31, 1970, 19358/70
Int. Cl. F22d *5/00*
U.S. Cl. 122—406 R 13 Claims



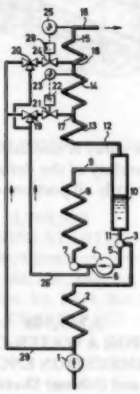
A quantity of steam of at least 30 percent, usually 50 percent of the total is produced under forced circulation in one evaporator within the gas flue while a quantity of steam of less than 40 percent of the total is produced under natural circulation in the tube walls lining the flue. The forced circulation heating surface is disposed upstream of the natural circulation heating surface in the working medium flow.

3,769,942

METHOD OF REGULATING THE TEMPERATURE OF SUPERHEATED STEAM IN A STEAM GENERATOR

Johannes Brehler, Hegnach, Germany, assignor to Sulzer Brothers, Ltd., Winterthur, Switzerland

Filed Jan. 12, 1972, Ser. No. 217,301
Claims priority, application Germany, Jan. 13, 1971, P 21 01 563.4
Int. Cl. F22g *5/12*
U.S. Cl. 122—479 S 6 Claims



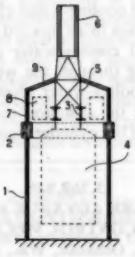
The water which is injected into the stream is obtained from the delivery side of the circulating pump. When the pump is inoperative, e.g. at high load, the water is obtained from a point upstream of the feed water preheater. Valves are also provided to regulate the amount of injected water in dependence on the steam temperature.

3,769,943

THERMAL POWER STATION

Paul Gerard, Creteil, France, assignor to Societe Generale d'Enterprises, Paris, France

Filed Mar. 29, 1972, Ser. No. 239,028
Int. Cl. F22b *37/24*
U.S. Cl. 122—510 4 Claims



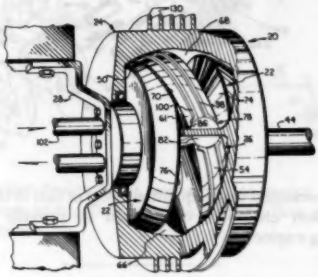
A thermal power station employs a boiler room in the form of a concrete oven and a chimney, preferably metallic, placed above the boiler room.

3,769,944

ROTARY ENGINE

Charles Raymond, Berkeley, Calif., assignor to Redskin Engines Company, Berkeley, Calif.

Continuation-in-part of Ser. No. 197,449, Nov. 10, 1971, abandoned. This application May 8, 1972, Ser. No. 250,884
Int. Cl. F02b *53/06*; F01c *1/08*; F03c *3/00*
U.S. Cl. 123—8.35 48 Claims



A rotary engine for use as a fluid pump or motor, gas compressor or vacuum pump, or internal combustion engine with improved performance and reduced exhaust emissions as compared to conventional engines. The rotary engine provides a cycle of alternately expanding and contracting volumes through purely rotational movement in certain embodiments, or through precessional-type movement in other embodiments. In one embodiment a stator element is formed with side walls which define an annular cavity through which primary and secondary rotors are adapted to turn with conjoint angular velocites about intersecting axes disposed at a predetermined oblique angular relationship. One or more vanes project into the cavity and are slidably fitted in cylindrical seals which accommodate relative swivel motion between the vanes and rotors throughout a full cycle of rotation. Inlet means is provided to direct the working fluid or a combustible charge into selected portions of two diametrically and axially opposed chambers, and outlet means is provided to direct the fluid or exhaust gasses from the chambers. In the internal combustion engine embodiment valve means is provided adjacent one vane to direct a compressed charge from the trailing portion of one chamber across to the leading portion of an opposite chamber where combustion occurs. In another embodiment a disc is mounted for precessional-type movement within a stator carrying one or more fixed vanes, with a power shaft rotatably mounted relative to the stator about a first axis, and with this shaft rotatably mounted relative to the disc about a second axis obliquely intersecting the first axis.

3,769,945

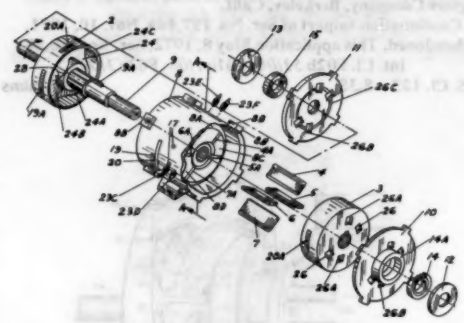
ROTARY INTERNAL COMBUSTION ENGINE

George H. Kahre, Shreveport, La.

Filed Dec. 13, 1971, Ser. No. 207,129
Int. Cl. F02b *53/08*
U.S. Cl. 123—8.23 6 Claims

A rotary internal combustion engine which includes a cylindrical housing, a pair of rotors, each having a sinuous race in one face thereof, both rotors being mounted on a common shaft and adapted to rotate with respect to the housing, and compression heads slidably mounted in the housing and

adapted to engage each rotor sinuous race to form combustion chambers. The rotors and compression heads are so mechani-



cally interrelated that sequential firing of fuel in the respective combustion chambers is effected to provide a smoothly operating engine.

3,769,946

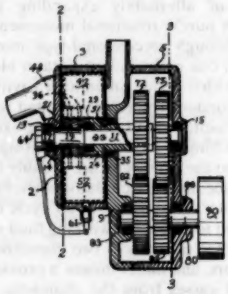
ROTARY ENGINES

William A. Scherrer, 6702 Alvina St., Bell Gardens, Calif.

Filed July 14, 1969, Ser. No. 841,399

Int. Cl. F02b *53/00*; **F01c** *1/00*

U.S. Cl. 123—8.47 **13 Claims**



A housing defining a circular chamber. Two radial pistons with each piston comprising curved blocks, the pistons being journaled within the circular chamber of the housing for rotation and relative angular reciprocation. Working chambers defined by the pistons within the circular chamber. The rotation and angular reciprocation of the pistons is achieved by elliptical gears. Other forms of gear arrangements for this purpose are also described.

3,769,947

AUXILIARY ENGINE COOLING APPARATUS

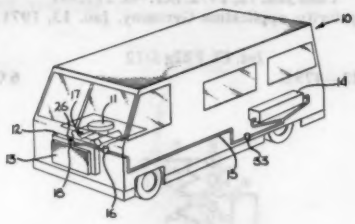
Norman R. Crain, Huntington Beach, Calif., assignor to Lucas Radiator and Refrigeration, Inc., Van Nuys, Calif.

Filed Aug. 10, 1972, Ser. No. 279,732

Int. Cl. F01p *9/04*

U.S. Cl. 123—41.01 **10 Claims**

An improved auxiliary cooling apparatus for vehicle engines. A segregated source of water or suitable fluid is activated after the engine temperature has exceed a predetermined level. The water is emitted upon the radiator of the engine in a manner which is substantially independent of vehicle velocity. A spray member is disposed at a suitable interval from the radiator and at the upper portion thereof. A radial spray is directed downwardly. The initial portion of the spray upon being emitted from the spray member is shielded by a



deflection screen. The spray is shielded from the wind velocity until it passes the boundary of the deflector after which it will be directed to substantially all portions of the radiator.

3,769,948

CYLINDER HEAD FOR A WATER-COOLED INTERNAL COMBUSTION ENGINE

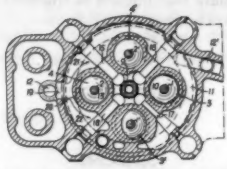
Gerhard Feichtinger, and Othmar Skatsche, both of Graz, Austria, assignors to Hans List, Graz, Austria

Filed Aug. 2, 1972, Ser. No. 277,288

Claims priority, application Austria, Aug. 3, 1971, 6786

Int. Cl. F02f *1/38*; **F01p** *3/02, 3/12*

U.S. Cl. 123—41.31 **5 Claims**



A cylinder-head for an internal combustion engine with two suspended intake and exhaust valves for each cylinder, two exhaust valve ducts merging into a common exhaust valve port, a first cooling-water chamber forming an annular chamber surrounding the intake and exhaust valves and having a cooling-water outlet, a second cooling-water chamber extending centrally between the valves in an upward direction and communicating with the first cooling-water chamber by means of radial ducts extending through the webs between adjoining valves, the second cooling-water chamber terminating as a duct extending above the common exhaust port as far as a cooling-water outlet of the cylinder-head.

3,769,949

INTEGRATED SPARK ADVANCE AND CARBURETOR VALVE CONTROL MECHANISM

Raymond L. Elingsen, Oshkosh, Wis., assignor to Brunswick Corporation, Skokie, Ill.

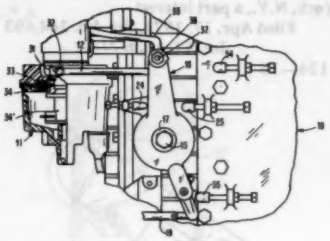
Filed Aug. 7, 1972, Ser. No. 278,238

Int. Cl. F02d *37/00, 9/00*; **F02p** *5/04*

U.S. Cl. 123—99 **8 Claims**

A dual control linkage simultaneously advances the spark, through rotation of the distributor housing, and opens the car-

buretor valve by means of a rotating cam. Spark advance is stopped at some predetermined carburetor valve setting; however, further cam rotation continues to increase the carburator valve opening.



3,769,950

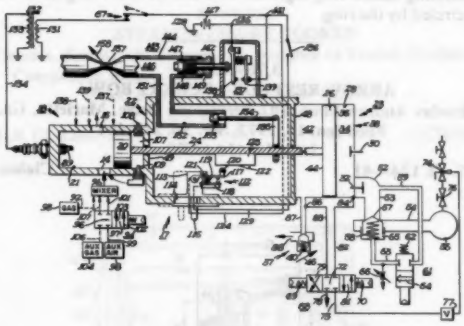
FREE PISTON ENGINE STARTING APPARATUS

Anton Braun, Minneapolis, Minn.

Continuation of Ser. No. 66,386, Aug. 24, 1970, abandoned. This application Nov. 29, 1971, Ser. No. 202,973

Int. Cl. F02b *71/02*

U.S. Cl. 123—46 A **17 Claims**



Apparatus and method features are disclosed for starting free piston engines, and particularly for initiating combustion on the first power stroke of such an engine or on a recycled starting stroke. Such an initial power stroke is achieved by spark ignition of a suitable mixture in a combustion chamber of the free piston engine, preferably in the power cylinder. The first combustion is obtained at a pressure relatively lower than the compression ratio used for combustion during normal operation. Thus one may even use a negligible compression within such chamber to provide a first power stroke which initiates movement of the engine, but which provides substantially less dirving force than that which is provided by a regular power stroke once such an engine is running.

3,769,951

THROTTLE CONTROL DEVICE

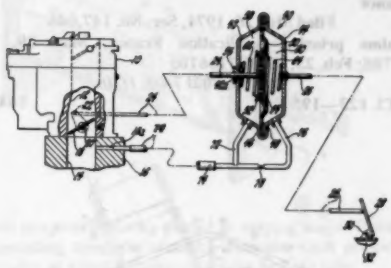
William H. Holl, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 10, 1972, Ser. No. 295,815

Int. Cl. F02d *11/08, 11/04*

U.S. Cl. 123—103 C **5 Claims**

A throttle control device for an internal combustion engine wherein the movable wall of a dual chamber pneumatic power unit is connected to a throttle rod and the housing of the power unit is connected to the accelerator rod, the two chambers of the power device being connected to engine intake manifold vacuum with a flow restriction in the flow path to one of the chambers.



3,769,952

INSTALLATION FOR VENTING A FUEL TANK OF A MOTOR VEHICLE PROVIDED WITH EXPANSION TANK

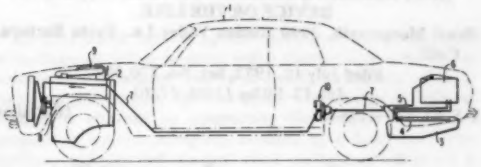
Horst Fiedler; Ludwig Fricker, both of Stuttgart, and Willi Renz, Scharnhausen, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Untertuerkheim, Germany

Filed Jan. 19, 1972, Ser. No. 219,027

Claims priority, application Germany, Nov. 16, 1971, P 21 56 828.5

Int. Cl. F02m *21/02*

U.S. Cl. 123—136 **23 Claims**



An installation for the venting and pressure relief of a fuel tank for an internal combustion engine equipped with an expansion tank, in which the fuel tank is connected by means of a line with the expansion tank, and which includes within a housing a vent valve, a safety valve and a pressure relief valve; the pressure relief valve selectively opens or closes a connection between the expansion tank and the inlet of the internal combustion engine; the housing of the installation includes an annular space in communication on one side with a connecting stub adapted to be connected with the expansion tank while the other side of the annular space is in communication with the vent valve; this annular space is also connected with two further annular spaces that are disposed axially offset to both sides of the stub connection; one of the further annular spaces is connected with the atmosphere by way of a valve opening which s controlled by the safety valve while the other further annular space is connected with the line leading to the internal combustion engine by way of a valve opening which is controlled by the pressure relief valve.

3,769,953

CRANK CASE FOR AN INTERNAL COMBUSTION ENGINE OR THE LIKE

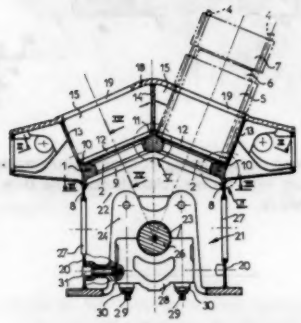
Karl Walter Kuhn, Saint-Germain-en-Laye, France, assignor to Societe d'Etudes de Machines Thermiques, Saint-Denis, France

Filed May 26, 1971, Ser. No. 147,046

Claims priority, application France, May 29, 1970, 7019788; Feb. 23, 1971, 7106105

Int. Cl. F02f *7/00, 1/10*

U.S. Cl. 123—195 R **14 Claims**



A crank-case for an internal combustion engine comprising a flat supporting structure extending throughout the length of the crank-case and consisting of a single supporting plate consisting of one single for example integrally cast or rolled part forming a single continuous main beam made in one piece and receiving the fastening ends of the cylinder tie-bolts whereas the transverse partitions and longitudinal walls consist each one of a bottom portion and of a top portion in extension of one another and welded to said supporting plate above and below same, respectively, while being separated therefrom.

3,769,954

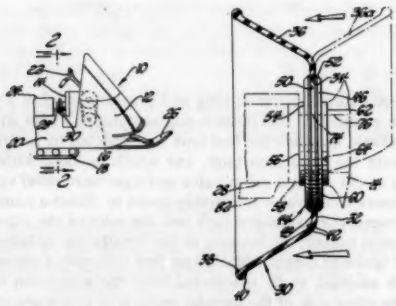
HEAT DEFLECTOR SHIELD FOR FUEL METERING DEVICE OR THE LIKE

Henri Morgenroth, 3090 Hidden Valley Ln., Santa Barbara, Calif.

Filed July 10, 1972, Ser. No. 270,207

Int. Cl. F02m *15/06, 17/30*

U.S. Cl. 123—198 E **10 Claims**



A generally cup-shaped resilient heat deflector shield is secured to an engine and related carburetor; the shield has at least two positions one of which deflects the flow of hot air away from the carburetor while a second position, determined by the resilient deformation of the shield, enables ready excess to externally accessible adjustment means carried by the carburetor.

3,769,955

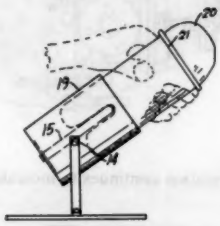
BALLOON LAUNCHING APPARATUS WITH TARGET INDICATING RING

Robert Dugan, and Shelby J. Boone, both of Minneapolis, Minn., assignors to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Apr. 17, 1972, Ser. No. 244,693

Int. Cl. A63b *71/02*

U.S. Cl. 124—16 **2 Claims**



A game of skill in which an elongated balloon is pressed into a mounted cylindrical launching tube, against a projection in the launching tube, and released permitting the balloon to fly out of the tube on a trajectory determined by the postion of the tube. The balloon is encircled by an elasitc band or ring prior to launching, and the encircling ring is ejected by the balloon at the point of impact. The complete game may include the launching tube and mount, an elongated balloon and encircling elastic ring together with one or more targets to be encircled by the ring.

3,769,956

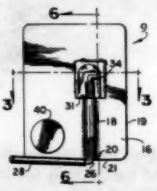
ARROW REST FOR ARCHERY BOW

Miroslav Andrew Simo, 107 Berrywood Drive, Marietta, Ga.

Filed Jan. 13, 1972, Ser. No. 217,464

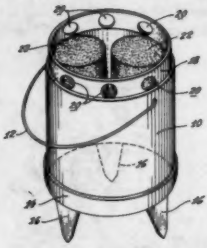
Int. Cl. F41d *11/00*

U.S. Cl. 124—41 **7 Claims**



A retractable arrow rest for an archery bow to support an arrow in proper position for shooting. The arrow rest includes an L-shaped member having an upright arm rotatably mounted in a sleeve that is connected to a bow mounting member. The arrow rest also includes an arrow supporting leg inclined outwardly from the bottom of the upright arm. The arrow supporting arm is spring biased outwardly from a bow to an angle extending generally along and across the direction of arrow flight and retracts out of the way upon forward movement of an arrow. The mounting member supports the upright arm and the arrow support leg and has adhesive for attaching it to a bow. The upright arm is housed in a friction-reducing sleeve. A spring for biasing the upright arm is positioned above the sleeve and has a cover there-over. The upper end of the upright arm has a member attached thereto for limiting the rotation of the upright arm. A friction-reducing cushion is positioned on the mounting member for engaging an arrow. The arrow supporting leg has a friction reducing sleeve positioned thereon.

3,769,957
PORTABLE HEATER-COOKER
Akikazu Ozaki, Osaka, Japan
Filed July 21, 1972, Ser. No. 273,723
Int. Cl. F24b 3/00
U.S. Cl. 126—9 A 3 Claims



A portable heater-cooker is provided which includes a metallic container shaped as a pair of buckets and a cover which fits over the open top of the container, but which can be removed and fitted over the bottom of the container to form a stand for the unit. The unit can be merchandised complete with chemically treated charcoal or other suitable solid fuel. It is intended for the unit to be disposed after it has served its purpose, and after the solid fuel contained therein has been burned. disposable

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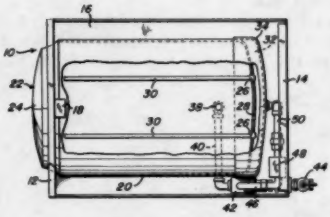
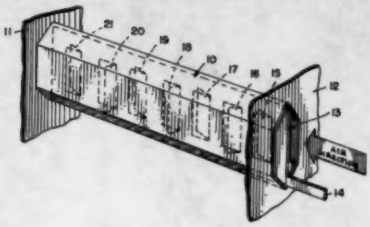
3,769,958
STEAM PRESSURE COOKER
Orest A. Kozinczuk, Chicago, Ill., assignor to Vischer Products Company, Chicago, Ill.
Filed June 23, 1971, Ser. No. 155,999
Int. Cl. A21b 3/02
U.S. Cl. 126—20 6 Claims



A steam pressure unit for cooking food and the like with dry steam includes a double wall at one end which serves as a manifold for feeding steam pipes which then distribute the steam at uniform pressures to the interior of the unit. The manifold also serves as a separator, with condensate which collects in the manifold draining from the manifold through a condensate valve into the interior of the unit for removal therefrom through a drain valve.

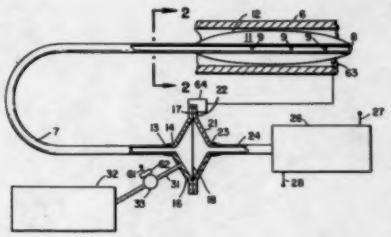
3,769,959
HEATING TUBE AND BAFFLE FOR DEEP FAT FRYERS
James W. Parker, Chicago, Ill., assignor to Chicken Unlimited, Inc., Chicago, Ill.
Filed Mar. 2, 1972, Ser. No. 231,226
Int. Cl. F28f 7/00
U.S. Cl. 126—91 5 Claims

The invention is directed to an improved heating tube for deep fat fryers and particularly to a baffle which is inserted in the heating tube, said baffle consisting of an elongated strip of metal having projections struck out from alternate sides of the



strip, said projections being placed at varying angles from the strip depending upon the distance between each projection and the point at which a flame enters the heating tube.

3,769,960
INTRA-AORTIC BALLOON SYSTEM
Thomas C. Robinson, El Cerrito, Calif., assignor to The United States of America as represented by the Secretary, Department of Health, Education and Welfare, Washington, D.C.
Filed Apr. 17, 1972, Ser. No. 244,534
Int. Cl. A61b 19/00
U.S. Cl. 128—1 D 5 Claims



An intra-aortic balloon system includes a balloon adapted to be disposed within an aorta and to change from a minimum volume to a maximum volume at which the balloon substantially but not entirely fills the aorta. The change in balloon volume is effected by connecting the balloon through a catheter to a slave casing cup covered by a diaphragm. The balloon, catheter and covered slave casing cup constitute a substantially closed volume filled with physiologically acceptable gas. Movement of the diaphragm portion of the closed volume produces a substantially equal volume variation of the balloon. A master casing cup is disposed against the other side of the diaphragm and is supplied with a working gas, the pressure of which is changed according to a program. Leakage of physiologically acceptable gas is detected and made up when necessary. The slave casing cup volume is changeable to match different balloons or to match the same balloon under changed operating conditions.

3,769,961
CONJUNCTIVAL DEVICE
Irving Fatt, 1891 San Antonio Rd., Berkeley, Calif., and Sotiris Kitrilakis, 33 Roble Rd., Berkeley, Calif.
Filed July 20, 1972, Ser. No. 273,421
Int. Cl. A61b 5/02, 3/00
U.S. Cl. 128—2 T 11 Claims

A blood condition indicating and detecting device for use with the palpebral conjunctiva, especially for physiological measurement, includes a locating body having a primary layer with a concave face adapted to abut the sclera and having a

convex face adapted to abut the palpebral conjunctiva. The locating body is arranged to be away from the cornea and supports an electrical detecting device having a surface abutting

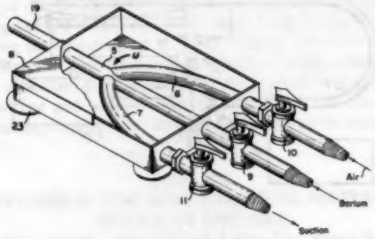
the palpebral conjunctiva. Electrical leads extend from the detecting device through the locating body, emerge near one edge thereof, and are connected to an appropriate indicating device.

3,769,962

BARIUM ENEMA ADMINISTRATION METHOD AND APPARATUS

Raymond L. McVey, 407 Uluniu St., Kailua, Oahu, Hawaii

Filed Oct. 29, 1971, Ser. No. 193,680
Int. Cl. A61b *6/00;* **A61m** *25/00*
U.S. Cl. 128—2 A **6 Claims**



Barium enema fluid is supplied to a patient through a three-way union of conduits, one of which is connected to a gravity fed barium supply source, another of which is connected with a source of air under pressure, and the other of which is an evacuation line connected to a source of suction. Each conduit is controlled by an individual valve. The valves are opened and closed in a prescribed sequence as directed by a radiologist who takes X-rays at various stages during and after administration of the enema.

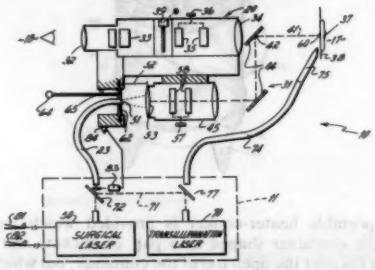
3,769,963

INSTRUMENT FOR PERFORMING LASER MICROSURGERY AND DIAGNOSTIC TRANSILLUMINATION OF LIVING HUMAN TISSUE

Leon Goldman, 2324 Madison Road, and R. James Rockwell, Jr., 6282 Coachlite Way, both of Cincinnati, Ohio

Filed Mar. 31, 1972, Ser. No. 239,976
Int. Cl. A61b *5/00*
U.S. Cl. 128—2 R **25 Claims**

An instrument for performing delicate surgery on man is provided with a continuous wave laser source specially associated with a binocular surgical microscope. The laser source emits electromagnetic radiation at wavelengths, preferably in the visible light range but also in the near visible infrared and ultraviolet ranges, which are absorbed selectively by different types of human tissue or tissue substructures. The source is mounted on a portable base remote from the operating area, and the radiation from the laser is communicated through a flexible fiber optic conductor to the binocular surgical operating microscope which is mounted on an articulating arm extending from the base so that the microscope may be freely positioned adjacent to the patient at the operating area. The laser beam is directed onto the tissue of the patient in a path coaxial with the viewing axis of the microscope to a point in the microscope's field of view. Controls on the microscope give the surgeon complete control of the laser beam. These include a focusing telescope for control of the laser spot size and



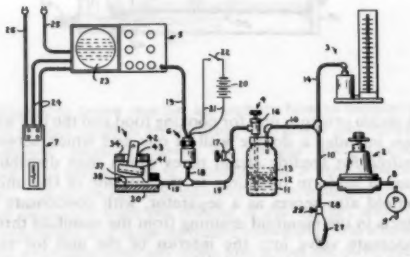
angle of convergence of the beam, a joy stick control for moving the fiber optic tip to cause a corresponding movement in the focused laser beam on the tissue within the field of view of the microscope to allow the surgeon to precisely prescribe an incision or effect localized irradiation on that area of the patient. Transillumination of the tissues in the area of interest on the patient is possible by the direct laser beam emitted at a low-nonhazardous power level or by a second laser system which may be operated independently of the main high power surgical laser and is delivered by a hand-held sterile probe.

3,769,964

SYSTEM AND METHOD FOR ACCURATELY MEASURING ARTERIAL BLOOD PRESSURE

Rulo Wayne Smith, Auburn, Ind., assignor to Rieke Corporation, Auburn, Ind.

Continuation-in-part of Ser. No. 56,169, July 9, 1970, abandoned, Continuation of Ser. No. 617,973, Feb. 23, 1967, abandoned. This application Aug. 28, 1970, Ser. No. 67,872
Int. Cl. A61b *5/02*
U.S. Cl. 128—2.05 G **3 Claims**



The system includes a sensor with a liquid filled bladder inside of a human body finger clamping device. A transducer connected to the clamping device translates the liquid pressure into an electrical signal. The pressure is adjustable externally and the resulting electrical signal is displayed on an oscilloscope to give an indication of the pressure applied by the liquid to a finger clamped in the finger clamping device. Blood pressure pulses sensed by the sensor produce an alternating current portion of the electrical signal and this is displayed on a chart recorder to give an indication of the pulse pressures.

To determine blood pressure, a finger is inserted into the clamp and external pressure is applied to the finger. The external pressure is adjusted to the lowest pressure at which the pulse pressure indications are at a maximum value. The electrical signal will then have a maximum (peak) voltage and a minimum voltage displayed on the oscilloscope. True systolic pressure is represented by the maximum peak voltage and true diastolic pressure is represented by the minimum peak voltage.

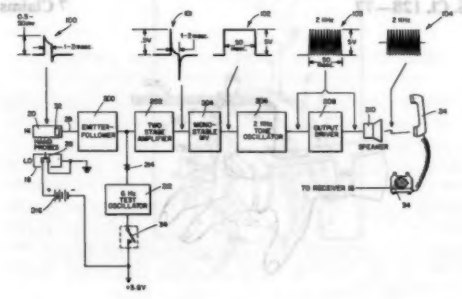
The device is built to have a minimum of compliance, so that the natural expansion and contraction of the finger arteries is at a minimum. This prevents any stiffness of the artery walls from affecting the blood pressure reading. The difference between the true systolic pressure and a systolic pressure reading taken conventionally by collapsing an artery, is a measure of the stiffness of the artery.

3,769,965

MONITOR APPARATUS FOR IMPLANTED PULSE GENERATOR

William J. Raddi; Jerome L. Kligerman, both of Philadelphia, Pa., and Cal C. Herrmann, Bellevue, France, assignors to ESB Incorporated, Philadelphia, Pa.

Filed Feb. 23, 1971, Ser. No. 118,144
Int. Cl. A61b *5/02*
U.S. Cl. 128—2.05 R **3 Claims**



A monitor apparatus is disclosed for monitoring electrical stimulation signals due to either natural or artificial electrical stimulation of a body part via a communication link such that the repetition rate of the electrical stimulation signals can be determined. The monitor apparatus comprises the subsystems: a transducer; a communication link or network; and a reciever. The transducer is adapted to sense the electrical stimulation signals generated either naturally or by an electronic organ stimulator, such as an implanted cardiac pacer, and to convert the electrical stimulation signals to audible signals such as tone bursts. These audible tone bursts are then transmitted over a communication link such as the standard telephone network to the receiver located at a remote telephone station, typically a cardiologist's office. The receiver is adapted to measure the time interval between received tone bursts. The receiver is further adapted to display or indicate to an observer the time interval between received tone burst. If desired, the receiver can be adapted to indicate directly the repetition rate of the stimulation signals. The information is then utilized by an observer for diagnostic purposes.

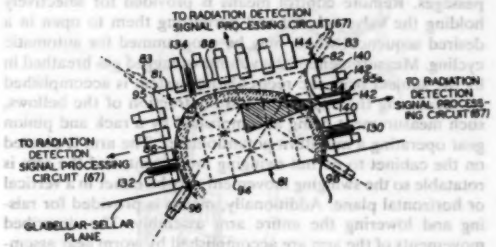
The monitor apparatus also includes a test means for testing the integrity of the apparatus including the transducer, the communication link and the receiver.

3,769,966

APPARATUS FOR DETERMINING LOCAL CEREBRAL BLOOD FLOW

Myron Youdin, Flushing, and June N. Barker, New York, both of N.Y., assignors to New York University, New York, N.Y.

Filed Mar. 22, 1971, Ser. No. 126,770
Int. Cl. A61b *5/02, 6/00*
U.S. Cl. 128—2.05 F **37 Claims**


TO RADIATION DETECTION SIGNAL PROCESSING CIRCUIT (67)
TO RADIATION DETECTION SIGNAL PROCESSING CIRCUIT (67)
TO RADIATION DETECTION SIGNAL PROCESSING CIRCUIT (67)
GLABELLAR-SELLAR PLANE

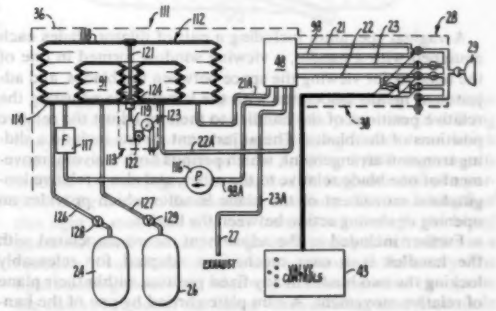
An apparatus for determining local cerebral blood flow in a discrete radiation emission detection zone of a patient's brain. The brain is subdivided into a plurality of detection zones, such as 144, by means of a headgear apparatus which defines these detection zones by means of a multiplanar array of an equal number of detectors, each detector having an associated collimator to limit the field of view of the detector. A radioactive gas such as Xe^{133}, is inhaled by the patient, such as in a closed inhalation-exhalation breathing system, over a predetermined data collection period during which the concentration of the gas in the blood is periodically increased. Determinations of arterial blood radiation concentration and tissue radiation concentration are made during this period, and the local cerebral blood flow is subsequently determined from these determinations. The arterial blood radiation concentration is preferably determined by determining the radiation concentration of the gas in the last part of an exhalation, while the tissue radiation concentration is preferably determined from the radiation emissions quantified by the detector array.

3,769,967

PULMONARY INHALATION DEVICE

George R. Jones, 135 W. Dickenson St., San Diego, Calif.; James F. Dunn, 2014 Broadway, and Glenn R. Purdum, 1360 Montgomery St., both of San Francisco, Calif.

Filed July 7, 1970, Ser. No. 52,977
Int. Cl. A61b *5/08*
U.S. Cl. 128—2.08 **8 Claims**



A device for use in making pulmonary studies involving the breathing into the lungs of radioactive tagged gasses. A face mask is attached to the distal end of an arm which is pivotally

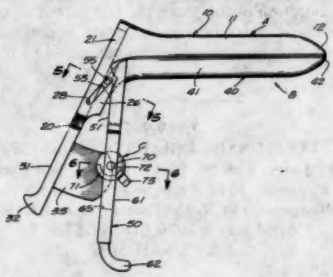
supported by a cabinet for adjusting the position of the mask. Conduits are provided in the arm for radioactive tagged gas, reservoir air and exhaust. These conduits communicate with a bellows located in the upper part of the cabinet and constituting part of a recirculating system for the radioactive tagged gas. A valving system is located in a valving head on the end of the arm in close proximity to the mask, with the valving head being formed with a plurality of passages and a plurality of demand-responsive one-way valves interconnecting the passages. Remote control means is provided for selectively holding the valves closed and permitting them to open in a desired sequence, which may be programmed for automatic cycling. Measurement of the volume of tagged gas breathed in by the subject from the recirculating system is accomplished by measuring the expansion and contraction of the bellows, such measurement being accomplished by a rack and pinion gear operating a multiturn potentiometer. The arm is pivoted on the cabinet to permit swinging movement, and the arm is rotatable so the swinging movement may be either in a vertical or horizontal plane. Additionally, means is provided for raising and lowering the entire arm assembly. The described movements of the arm are accomplished by worm gear assemblies which also serve to lock the arm in the desired position.

3,769,968

SPECULUM

Lester L. Blount, 7762 Bolsa Ave., Midway City, Calif., and Armando C. Hernandez, 802 N. Concord, Santa Ana, Calif.

Filed Nov. 22, 1971, Ser. No. 201,086
Int. Cl. A61b *1/32*
U.S. Cl. 128—17 **9 Claims**



A vaginal speculum including a pair of dilator blades each equipped with a handle, a viewing window formed in one of the handles for viewing the space between the blades, and adjustment means associated with the handles for adjusting the relative positions of the handles to thereby adjust the relative positions of the blades. The adjustment means include a sliding trunnion arrangement, which permits both a pivotal movement of one blade relative to the other, and also a relative longitudinal movement of the blade handles which provides an opening or closing action between the blades.

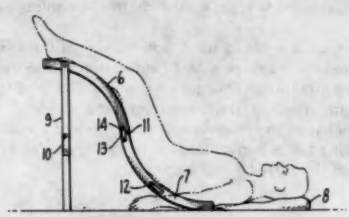
Further included in the adjustment means associated with the handles is a cam mechanism adapted for releasably locking the two blades in any fixed position within their plane of relative movement. A cam plate carried by one of the handles is located in the plane common to both the handle and its associated dilator blade, and projects through a longitudinal slot formed in the other handle. A rotating cam member supported from one wall of the slot is utilized for fastening the cam plate in any desired position.

3,769,969

THERAPEUTIC DEVICE

Jack A. Nezik, 4547 Callan Boulevard, Daly City, Calif.

Filed July 3, 1972, Ser. No. 268,727
Int. Cl. A61f *5/00*
U.S. Cl. 128—68 **4 Claims**



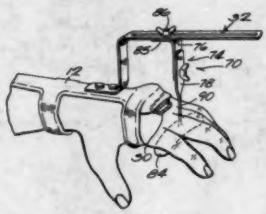
A therapeutic device for positioning a body in such a manner that the buttocks area of the body is elevated above the blood level of the heart area to relieve the pressure on the legs and buttocks area whereby relief is provided for one suffering from varicose veins, hemorrhoids, or various back injuries and ailments.

3,769,970

POSTOPERATIVE LUMBRICAL BAR AND BRACE

Alfred B. Swanson, 2945 Bonnell S.E., Grand Rapids, Mich.

Filed Aug. 25, 1972, Ser. No. 283,924
Int. Cl. A61f *5/10, 5/04*
U.S. Cl. 128—77 **7 Claims**



The lumbrical bar includes a stem attached at its upper end to the longitudinal bar of a dorsal splint and a transverse pad at its lower end to provide support of one or more of the proximal or distal phalanges. The stem is adjustable to permit placement of the pad above or below the fingers without rotating the splint. The stem includes a narrow neck portion to permit extension between two adjacent fingers. A palmar pad or flexion cuff can be utilized with the bar to provide flexion of the fingers.

3,769,971

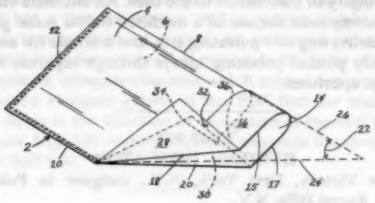
SURGICAL DRAPE

Robert F. Collins, Barrington, Ill., assignor to The Kendall Company, Boston, Mass.

Filed May 3, 1971, Ser. No. 139,641
Int. Cl. A61m *19/06*
U.S. Cl. 128—132 D **9 Claims**

An open-ended, sleeve-like surgical drape having a major longitudinal edge which normally rests on or above a body limb being draped and a cuff around at least a portion of the open end. Edges of the drape defining the opening at the open end extend away from said major longitudinal edge of the drape in a direction which forms an angle of less than 90° with the direction of the major longitudinal edge. Thus, an enlarged

opening is created at the open end to receive the limb being draped, and excess fabric which would exist if all the edges



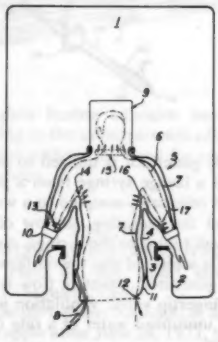
defining the opening at the open end were perpendicular to the major longitudinal edge is eliminated.

3,769,972

PROTECTIVE CLOTHING FOR AN OPERATOR WORKING IN A HERMETIC ENCLOSURE

Bernard Saint-Martin, Paris, France, assignor to La Calhene, Bezons, France

Filed Apr. 14, 1972, Ser. No. 243,933
Int. Cl. A61b *19/00*
U.S. Cl. 128—142.5 **10 Claims**



The invention is concerned with improvements in protective clothing for use by an operator working in a hermetic enclosure which is at a positive pressure to the ambient atmosphere. The clothing comprises a hermetic garment which has two walls which define an inflatable zone the inner wall being in contact with the operator and the outer wall forming part of the enclosure wall. A permanent leak is provided from the inflatable zone to the inside of the protective clothing by way of permeable means disposed on the inner wall. Means is also provided for permitting and adjusting the rate of leakage flow from inside the protective clothing either to the ambient atmosphere or to the inside of the hermetic enclosure.

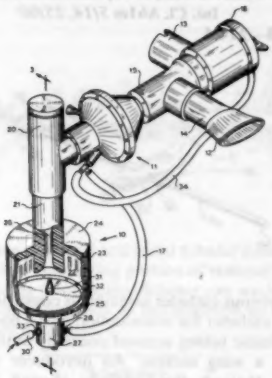
3,769,973

INTERMITTENT POSITIVE PRESSURE BREATHING APPARATUS

Aaron M. Esbenshade, Jr., 1700 S.W. 16th Court, Apt. D-28, Gainesville, Fla.

Filed July 24, 1972, Ser. No. 274,220
Int. Cl. A61m *16/00*
U.S. Cl. 128—145.8 **8 Claims**

An intermittent positive pressure breathing apparatus is provided to deliver gas to a patient under pressure intermittently upon demand and has a slidable tube with a nozzle on one end for directing an input gas through the tube into a venturi connected to a mouthpiece and exhalation valve. Flaps on the tube force the tube to move in accordance with the breathing of a patient and slide an opening in the tube into an alignment with a connection to a gas under pressure. An addi-



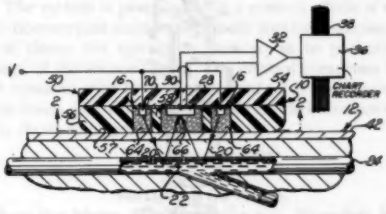
tional outlet from the tube also may be used to drive a nebulizer and the movements of the flaps connected to the tube is utilized to open and close an inlet for a second gas to be aspirated into the venturi.

3,769,974

BLOOD PULSE MEASURING EMPLOYING REFLECTED RED LIGHT

Richard C. Smart, Denver, and Kenneth D. Swonger, Littleton, both of Colo., assignors to Martin Marietta Corporation, New York, N.Y.

Filed June 29, 1971, Ser. No. 157,944
Int. Cl. A61b *5/02*
U.S. Cl. 128—2.05 P **2 Claims**



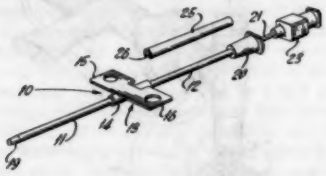
An improved pulse transducer for providing an output signal which varies as a function of the pulse rate of a living body includes a plurality of light emitting diodes from which red light of a wavelength of from 6,000 to 9,000 angstroms is emitted. This red light is transmitted through the skin of a portion of the body to the blood in an artery. The wavelength of this light is such that it is not transmitted through the blood but is reflected to a sensor with an intensity which varies as a function of variations in pulse wave pressure in the artery. The light emitting diodes are relatively cool to minimize changes in the characteristics of the blood vessels during examination. In addition, the use of red light tends to maximize the amount of light reflected back to the sensor from the red blood and to minimize the amount of light reflected by the white skin to thereby minimize the signal-to-noise ratio in the output signal from the sensor.

3,769,975

SLIT SLEEVE FOR PREVENTING DISPLACEMENT IN A CATHETER ASSEMBLY

Melvin Nimoy, East Brunswick, N.J., and Alon P. Winnie, Wilmette, Ill., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Nov. 26, 1971, Ser. No. 202,192
Int. Cl. A61m *5/14, 25/00*
U.S. Cl. 128—214.4 4 Claims



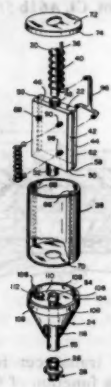
An intravenous catheter assembly is constructed with a flexible plastic catheter for introduction into a body member and a flexible plastic tubing secured coaxially to the proximal end thereof by a wing section. An introducer needle extends completely through the coaxially aligned lumens of the catheter and tubing and a removable plastic sleeve having a longitudinal slit therein is positioned over the tubing between the wing section and the tubing hub to prevent displacement of the wing section toward the hub during the catheter introduction procedure.

3,769,976

IRRIGATION APPARATUS

Ebrahim Victory, New York, N.Y., assignor to Pulsatron Corp., Forest Hill, N.Y.

Filed Dec. 6, 1971, Ser. No. 205,136
Int. Cl. A61m *3/00*
U.S. Cl. 128—229 8 Claims



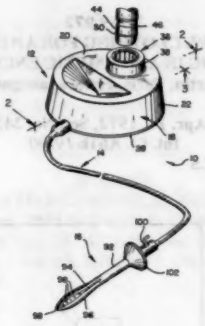
An irrigation apparatus particularly adapted for feminine hygiene applications. The apparatus utilizes a fluidic pulse generator to create a pulsating flow or jet. An anatomically contoured nozzle is provided with a plurality of discharge apertures for emitting a pulsating spray within a confined area, such as a vaginal cavity. Additionally, a medicament dispensing module is used in conjunction with the pulse generator for the introduction of an additive, such as an antiseptic, deodorant, medicinal preparation, etc. by aspiration of the additive into the flow. The nozzle is selectively connectible by snap-fitting couplings, to either the dispensing module or the pulse generator. Additionally, the nozzle is provided with a finger tip control valve for regulating the flow, and also includes a slidable gland, positionable around the nozzle for providing sealing contact with the vaginal cavity to control the nozzle reflux or drainage flow rate and to thereby prevent injury or discomfort to the user. An alternate embodiment encompasses the use of a modified fluidic pulse generator, for delivering two pulsating jets, and a nozzle for emitting alternately phased pulsating sprays through separate sets of discharge apertures.

3,769,977

HYGIENIC IRRIGATOR

Ebrahim Victory, New York, N.Y., assignor to Pulsatron Corp., Forest Hills, N.Y.

Continuation-in-part of Ser. No. 205,136, Dec. 6, 1971. This application May 8, 1972, Ser. No. 250,926
Int. Cl. A61m *3/00*
U.S. Cl. 128—229 10 Claims



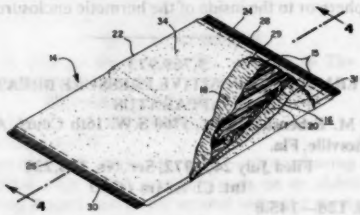
A fluidic pulse generator is utilized to provide a pulsating flow of water to a lavage syringe from a pressurized source. The generator is releasably coupled to a water supply, e.g., a lavatory tap and the pulsating outflow of the generator is channeled through tubing to the syringe. An additive solution carried in a well is aspirated into the outflow through a control channel of the generator. Lavative flow is controlled at the syringe with a fingertip valve; ventilation passageways in the generator drain unutilized water at a rate determined by the valve constriction.

3,769,978

DIAPER SYSTEM AND ABSORBENT PAD THEREFOR

George G. DeNight, Chester; James F. Farber, Wallingford; John J. Glodek, Chester, and Margaret D. Higgins, Philadelphia, all of Pa., assignors to Scott Paper Company, Delaware, Pa.

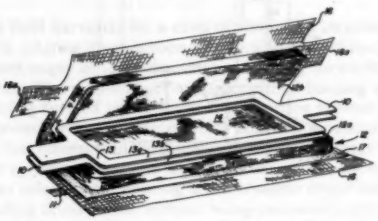
Filed Aug. 2, 1971, Ser. No. 168,132
Int. Cl. A61f *13/16*
U.S. Cl. 128—287 11 Claims



A diaper system having an elongate, fluid impervious pad-retaining garment and an elongate, disposable absorbent pad

retained in the garment. The elongate, disposable absorbent pad includes an absorbent layer disposed within a covering envelope, and the covering envelope has a porous facing layer and a backing layer. The absorbent layer includes a fluff batt of cellulosic fibers which is substantially rectangular and which has a forward section with a greater weight of fibers therein than a rearward section. An embossed pattern in the fluff batt includes compressed regions in the form of transversely spaced, elongate channels which extend for substantially the entire elongate extent of the fluff batt for transmitting body fluids in the direction of elongation of the fluff batt, and elongate high loft regions between channels for storing urine in the fluff batt.

3,769,979
SANITARY NAPKIN
Ethel Mae Freney, 3841 E. Illini St., Phoenix, Ariz.
Filed July 17, 1972, Ser. No. 272,680
Int. Cl. A61f *13/16*
U.S. Cl. 128—290 R **7 Claims**

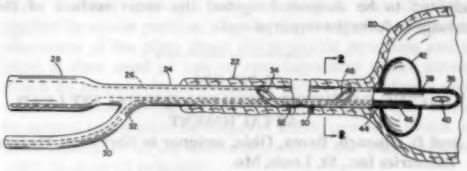


A sanitary napkin having adhesive means at the ends thereof for adhering to the undergarment of the user, thereby securing the napkin without the need for pins, belts or other mechanical appliances.

3,769,980
MEDICAL INSTRUMENTS
Harvey Karman, Playa Del Rey, Calif., assignor to Medical Concepts, Inc., El Segundo, Calif.
Continuation-in-part of Ser. No. 65,816, Aug. 21, 1970, abandoned. This application June 28, 1971, Ser. No. 157,196
Int. Cl. A61b *17/22;* **A61m** *1/00, 25/00*
U.S. Cl. 128—304 **3 Claims**

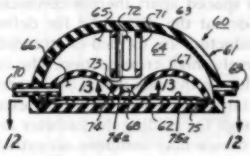
A combination of disposable medical instruments is provided which can be used when performing an abortion including a speculum comprising metal jaw members and disposable plastic tip members. The plastic tip members are fitted on the jaw members in snap-fit relationship and are shaped so that they adequately expose the cervix and tend to bring it forward toward the vaginal opening. A disposable curette or cannula for a suction aspirator is also provided and comprises a tube of plastic material which is sufficiently flexible to permit relatively easy bending of the tube during use and yet sufficiently rigid to maintain the desired tubular configuration during such bending. The tube is provided at its operative end with a pair of holes on opposite sides thereof, each of a size sufficient to pass the embryonic tissue therethrough.

3,769,981
URINARY CATHETER
Daniel M. McWhorter, Arlington Heights, Ill., assignor to The Kendall Company, Walpole, Mass.
Filed Feb. 9, 1972, Ser. No. 224,855
Int. Cl. A61m *25/00*
U.S. Cl. 128—349 B **8 Claims**



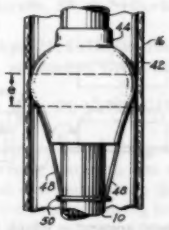
Catheters have proximal and distal tubular ends joined by a preferably flexible connecting portion of reduced diameter so that liquid draining through the catheter can wash the walls of the urethra. Rigidifying aids to the insertion of the catheter when flexible are described.

3,769,982
PHYSIOLOGICAL DRAINAGE SYSTEM WITH CLOSURE MEANS RESPONSIVE TO DOWNSTREAM SUCTION
Rudolf R. Schulte, 5377 Overpass Rd., Santa Barbara, Calif.
Filed Sept. 24, 1971, Ser. No. 183,463
Int. Cl. A61m *27/00*
U.S. Cl. 128—350 **30 Claims**



A physiological drainage system for draining liquids from a source of the human body to a region where it is disposed of. The latter region is at a different elevation from the source region. The system is provided with a control which is responsive to downstream suction. When the suction is excessive, the control closes the system to flow so as to prevent overdrainage of the source region. The control comprises a valve which remains open to flow at normal rates and downstream suction levels, and which closes when the downstream suction level is above some predetermined level.

3,769,983
MEDICAL DEVICES
Abraham Dov Merav, 5800 Arlington Ave., Riverdale, N.Y.
Filed Aug. 26, 1970, Ser. No. 67,123
Int. Cl. A61m *25/00*
U.S. Cl. 128—351 **9 Claims**



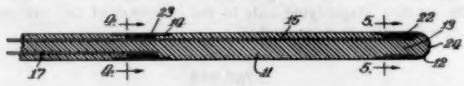
Apparatus for intubation within body passages, comprising an elongated tube having the usual opening at the distal end

and means for connection to a source of fluid, such as air, at the other end. Occlusion means is located about the surface of the tube near the open end to seal the space between the passage and the tube against flow of air. The occlusion means comprises a bag or canopy secured at its center, to the outer surface of the tube and terminating in a free edge directed toward the distal end being substantially open for receipt of air from the direction of the open end of said tube. The canopy is adapted to be distended against the inner surface of the passage to form the required seal.

3,769,984
PACING CATHETER WITH FRICTIONAL FIT LEAD ATTACHMENT

Lloyd D. Muench, Berea, Ohio, assignor to Sherwood Medical Industries Inc., St. Louis, Mo.

Filed Mar. 11, 1971, Ser. No. 123,242
Int. Cl. A61n *1/04*
U.S. Cl. 128—404 **6 Claims**

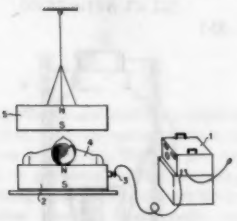


A device for transvenous insertion such as for use in connection with transmitting electrical pulses in a heart pacer. The device comprises a catheter having highly flexible electrical conductors spaced apart therein connected to a pair of spaced electrodes at the distal end for delivering a pacing signal. The conductors are formed of stranded tantalum filaments of extremely small cross-section. The catheter may include an axial lumen through which blood pressure measurements may be taken as well as permitting extension of guide wires therethrough for guiding the catheter as during venous insertion. The device may comprise an extruded plastic element with the conductor wires being coextruded therein for facilitated manufacture.

3,769,985
ELECTROSTATIC TREATMENT APPARATUS WITH CHARGE DISPERAL MEANS

Naoharu Fujii, 3-6-10 Jingumae, Shibuiya-ku, Tokyo; Kenkichi Tsukamoto, 462-1 Taki, Fujiwara-machi, Tochigi-ken; Momi Yamamoto, 2-chome, Kyo-machi, Kokura-ku, Fukuoka-ken, Kitakyusyu, and Fumiko Iijima, 2-1 Kyobashi, Chuo-ku, Tokyo, all of Japan

Filed Aug. 26, 1970, Ser. No. 67,103
Claims priority, application Japan, Aug. 31, 1969, 44/68613
Int. Cl. A61n *1/12*
U.S. Cl. 128—419 R **7 Claims**

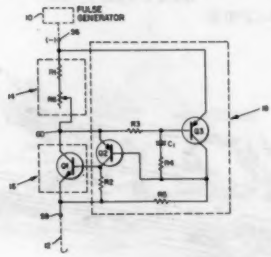


A medical treatment apparatus which improves upon existing high negative potential therapeutic devices by providing a single conductor member coupled to the single electrode which in turn is electrically connected to the generating means for generating the high negative potential charge. The single electrode has a continuous charge of only one type of magnetic polarity extending perpendicular from one surface of the electrode adapted to be placed over a subject to be treated. The magnetic field lines which extend perpendicularly from the treatment surface will extend perpendicularly into the surface of the patient being treated and the high negative potential charge deposited upon the surface of the patient will be dispersed along the surface of the patient substantially in a perpendicular direction to the magnetic field lines.

3,769,986
BODY ORGAN THRESHOLD ANALYZER

Cal C. Hermann, New Shrewsbury, N.J., assignor to E.S.B. Incorporated, Philadelphia, Pa.

Filed May 5, 1971, Ser. No. 140,361
Int. Cl. A61n *1/36*
U.S. Cl. 128—419 P **1 Claim**

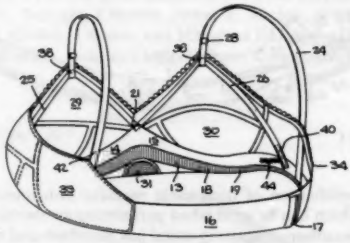


A current control device having particular application as a body organ threshold analyzer is described comprising pulse current selection means by which a desired output pulse current from a pulse generating means, such as a cardiac pacer, can be selected, pulse current control means by which the pulse current can be controlled, and a pulse current sensing and correcting means by which the pulse current is sensed and when deviations from the selected current occur, sends corrective signals to the current control means.

3,769,987
BRASSIERE CONSTRUCTION

Marvin R. Markowitz, 355 E. 72nd St., New York, N.Y.

Filed Dec. 16, 1971, Ser. No. 208,571
Int. Cl. A41c *3/00*
U.S. Cl. 128—484 **4 Claims**



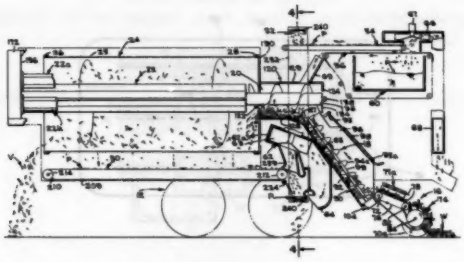
A brassiere which comprises a breast support band-mantle having a relatively stiff infra-mammal band adapted to fit below and adjacent to her breasts and extending from scapula to scapula and a less stiff mantle contiguous to said band and adapted to support the lower surface of the breasts. The band-mantle is attached to a shoulder strap by a pair of ledge straps, one of each pair being affixed to the center of the band-mantle and the other adjustably affixed towards the ends of the mantle in proximate relation to the pectoris lateralis.

3,769,988

LEGUME HARVESTER WITH AUGER FEEDS

Thomas I. Burenga, Evanston, Ill., assignor to FMC Corporation, San Jose, Calif.

Filed July 21, 1972, Ser. No. 274,019
Int. Cl. A01d
U.S. Cl. 130—30 H 10 Claims



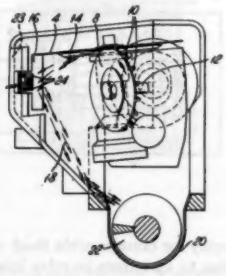
A field harvester for a crop of vines with attached legumes has a rotating drum screen with a main central beater and an infeed auger of large diameter projecting forwardly past the screen. The infeed auger has a peripheral housing with a feed opening formed in the lower front portion thereof. A pair of oppositely rotating crop elevator augers is mounted in a housing that connects to the opening in the infeed auger housing so that a mass of vines and legumes is fed up into a lower portion of an infeed auger housing and thereupon drops into the large rotating drum screen without being excessively compacted. A shelled crop conveyor runs forwardly beneath the drum screen and in its delivery end extends past the screen. A primary trash cleaning blower is mounted directly above the delivery end of the crop conveyor so that its inlet duct delivers trash directly to the fan portion of the blower without the need for elbows or the like in the duct.

3,769,989

CIGARETTE MAKING MACHINES

Francis Auguste Maurice Labbe, Neuilly-sur-Seine, France; Edward George Preston, and Clifford Russell Marritt, both of London, England, assignors to Molins Limited, London, England

Filed July 21, 1971, Ser. No. 164,505
Claims priority, application Great Britain, July 23, 1970, 35,746/70
Int. Cl. A24c *05/34*
U.S. Cl. 131—21 D 12 Claims



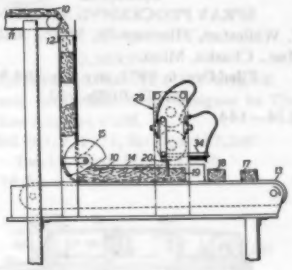
Excess shreded tobacco is discarded from a filler stream moving on a conveyor in a cigarette making machine by trimming the excess and discarding the same therefrom. A pair of rotating disc knives having a rotating brush adjacent thereto removes the excess and the brush discards the same toward and against a plate that is rigidly mounted at one end thereof. The remainder of the plate flexes or bends in proportion with the mass flow rate or quantity of discard tobacco striking the same. The magnitude of the flexure is measured by strain gauges and is used as an indicator of the mass flow rate of the discard tobacco. A rigid plate having a pivotable mounting at one end and a spoon shape at the other may also be used, in which case, the indicator of the mass flow rate may include a screw conveyor adapted to pass discard tobacco against the spoon portion, a spring may be applied to limit displacement of the plate about the pivotable mounting and the plate is then used as one of two capacitive plates through which an electric circuit is passed, thereby providing a quantitiative indication thereof. Alternately, a restoring force may be applied to the plate by means of a fluid operated piston, the force necessary to prevent movement of the plate then provides the desired indicator.

3,769,990

APPARATUS FOR TREATING A FLEECE OF FIBROUS MATERIAL

Hugh Charles Williams, Bristol, England, assignor to Imperial Tobacco Group Limited, London, England

Filed Jan. 17, 1972, Ser. No. 218,375
Claims priority, application Great Britain, Feb. 8, 1971, 4,141/71
Int. Cl. A24c *1/02*
U.S. Cl. 131—81 7 Claims



Apparatus for separating successive leading portions of tobacco rag from a fleece thereof on a horizontal imperforate conveyor wherein a separator device, which comprises two forks facing one another across the conveyor which are retractable together and are relatively separable in the direction of the conveyor to tear a leading portion away from the fleece, is arranged to operate above the conveyor and is movable around a circular path in a vertical plane, the forks being retracted together prior to their descending entry into the fleece.

3,769,991

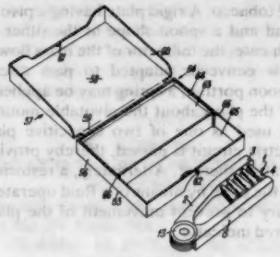
TOILET ARTICLE

Patrick John McGrath, 59 A Netherhall Gardens, London N.W.3, England

Filed Apr. 21, 1972, Ser. No. 246,179
Claims priority, application Great Britain, Apr. 22, 1971, 10,710/71
Int. Cl. A45d *44/18*
U.S. Cl. 132—84 R 8 Claims

This invention concerns a cleaning article, for example, a toothbrush, comprising two arms one of which carries or is adapted to carry at one end portion thereof a cleaning pad, brush or the like, the two arms being hinged together about a pivot so that the article may be stowed with the two arms folded one towards the other, those end portions of the arms which are interconnected being provided in or on facing surfaces one with a recess or groove and one with a projection,

the two surfaces being biassed towards each other and the arrangement being such that, as the two arms are pivoted apart



from each other, the projection rides over the facing surface of the other arm and then interfits in the said recess or groove in the in-use position of the article.

3,769,992

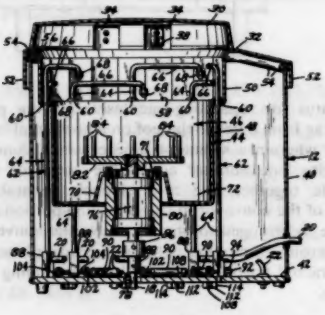
SPRAY PROCESSING MACHINE

Victor C. Wallestad, Minneapolis, Minn., assignor to Fluoroware, Inc., Chaska, Minn.

Filed Dec. 6, 1971, Ser. No. 204,910

Int. Cl. B08b *3/02*

U.S. Cl. 134—144 **7 Claims**



An apparatus is disclosed for washing, etching or otherwise spray processing various substrates or photographic plates, and for spin drying the objects at the termination of the processing. The objects to be cleaned or otherwise processed are carried by a rotatable platform mounted above an elevated bottom portion of a treatment chamber. Nozzles for directing various liquids onto the articles are mounted on conduits for movement from a position proximate the chamber walls to a position extending inwardly over the rotatable platform. The lengths of the conduits carrying the nozzles are alternately varied in order to facilitate storage of the nozzles most proximate the cylinder wall. When the nozzles are retracted against the cylindrical wall they are located over a ledge provided in the walls.

3,769,993

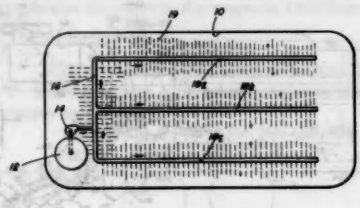
SWIMMING POOL CLEANING SYSTEM

John I. Schaeffer, 3 Forest Pl., Towaco, N.J.

Filed June 22, 1971, Ser. No. 155,590

Int. Cl. B08b *3/02, 9/08*

U.S. Cl. 134—167 R **10 Claims**



This invention pertains to a swimming pool system wherein a plurality of flexible conductors, preferably of extruded plastic, is provided with small apertures formed in their sidewalls. These outlets provide means for forming directed jet streams of water delivered through said conductors from a pressurized supply. The jets are directed against the bottom of the pool so as to stir up dirt and debris tending to accumulate on the bottom of the pool. This swimming pool cleaning system contemplates that extruded vinyl or like flexible tubing have a flat bottom to which is applied a contact adhesive adapted to retain the tubing on the bottom of the pool whether the pool is of concrete or is made with a plastic lining. Being flexible the conductors may be arranged on the bottom of the pool in any desired order so as to agitate natural silt accumulations. The extrusions shown are more or less semicircular and may be either a single or double channel and in one embodiment is formed with an extending wing disposed to deflect the water downwardly. The jet nozzles may be only small holes or may also be short tubes.

3,769,994

A LOAD INSENSITIVE TIME DELAY RELAY

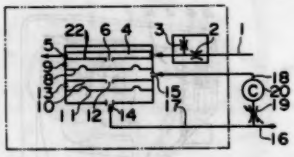
Toshiro Hirao, Kamoi-cho, Midori-ku, Yokohama-shi, Kanagawa-ken, Japan

Filed July 18, 1972, Ser. No. 272,870

Claims priority, application Japan, July 26, 1971, 46/55208

Int. Cl. G05d *16/00*

U.S. Cl. 137—84 **6 Claims**

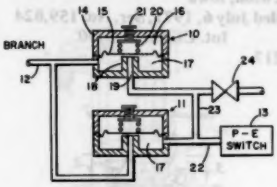


A time delay relay for compressible fluid operated systems which is insensitive to variations in relay load resistance and which includes an enabling vent port closing diaphragm responsive directly to a signal pulse together with an operating fluid control vent closing diaphragm responsive to the enabling vent closure and to the passage of a divided portion of the signal pulse fluid through time delay means. The operating air is either vented to or augmented from ambient air or the atmosphere depending on load resistance.

3,769,995
DIAPHRAGM LOGIC SWITCHING CIRCUIT

Frederick D. Joesting, Park Ridge, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sept. 15, 1971, Ser. No. 180,800
Int. Cl. F15c 3/04
U.S. Cl. 137—829 10 Claims

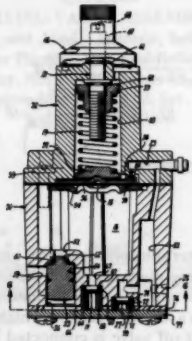


A diaphragm logic switching circuit with adjustable switching points for direct acting or reverse acting switching between zero and a branch pressure input signal or between zero and a main pressure input signal.

3,769,996
FLUID TIMER AND METHOD

Edward L. Holbrook, Pinole; William B. Gripe, Concord, and Melvin H. Norman, Oakland, all of Calif., assignors to Amot Controls Corporation, Richmond, Calif.

Filed Apr. 19, 1971, Ser. No. 135,317
Int. Cl. F16k 31/145
U.S. Cl. 137—102 6 Claims

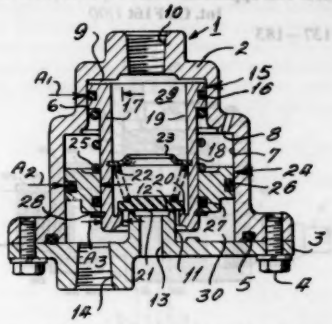


A timer apparatus and method wherein a fluid signal is produced at a predetermined time in a passage at the downstream side of a choked fluid pressure supply line by the opening and/or closing of a vent connected to such passage, and wherein such vent opening and/or closing is a function of the change in fluid pressure in a chamber occasioned by fluid flow through a predetermined size orifice connected to the chamber.

3,769,997
CONTROL VALVE

David R. Hardwick, Maryland Hgts., and Raymond F. Stelzer, Bel Nor, both of Md., assignors to Wagner Electric Corporation, Newark, N.J.

Filed July 3, 1972, Ser. No. 268,927
Int. Cl. F16k 17/10
U.S. Cl. 137—102 16 Claims

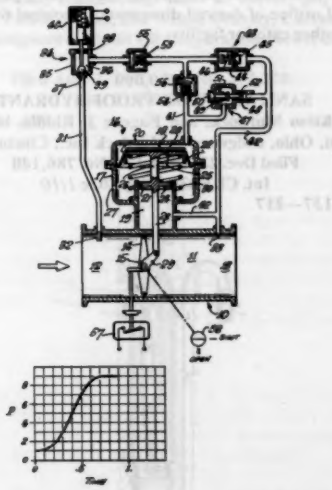


A control valve for varying fluid pressure applied to the front brakes is provided with a proportioning member including a resiliently urged member caged therewith for concerted and relative movement.

3,769,998
REGULATOR AND SHUTOFF VALVE

William W. Avant, Scottsdale, Ariz., assignor to The Garret Corporation, Los Angeles, Calif.

Filed Oct. 7, 1971, Ser. No. 187,340
Int. Cl. F16k 31/12, 31/36
U.S. Cl. 137—116.5 6 Claims



This valve is employed to control flow of fluid under pressure from a source to apparatus, such as a fluid motor, to effect its operation. The valve regulates the pressure and the application thereof to the using mechanism in such a manner as to prevent initial shock torque. Such result is secured by providing a valve which will initially open slowly by using a relief valve which is reset with downstream pressure for limiting the opening pressure applied to the valve actuator. After the initial opening the pressure is rapidly increased to and main-

tained in a predetermined range by using a simple reference pressure regulator having downstream pressure trim.

3,769,999

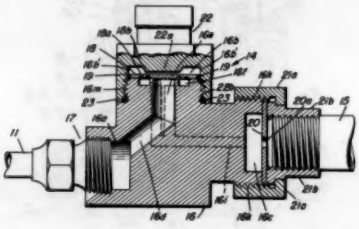
LIQUID SEPARATOR SYSTEM AND APPARATUS

James P. Flanagan, P.O. Box 245, and Jack L. Carter, P.O. Box 464, both of Hooker, Okla.

Continuation of Ser. No. 126,718, March 22, 1971, abandoned. This application Mar. 19, 1973, Ser. No. 342,860

Int. Cl. F16t *1/00*

U.S. Cl. 137—183 7 Claims



Apparatus for separating liquid from gas, particularly in natural gas field operations. The apparatus comprises a separator tank included in a gas pipeline, a liquid separator valve, and a tube having an inlet portion within the tank to maintain condensate or other liquid within the same at a desired level and an outlet portion connecting with the valve. The valve itself comprises a body with enlarged inlet chamber, a rising passage communicating therewith, a circumferential groove about the rising passage, downwardly extending passages spaced on opposite sides of the rising passage, and an outlet passage communicating with the same. The valve includes a floating disc within an upper chamber and seating atop the rising passage, the disc being provided with one or more concentric grooves on its under surface to reduce fluid turbulence. An outlet fitting engages the housing in communication with the outlet passage, the fitting being provided with a central orifice of desired dimension to control the flow to a tank or other exterior facility.

3,770,000

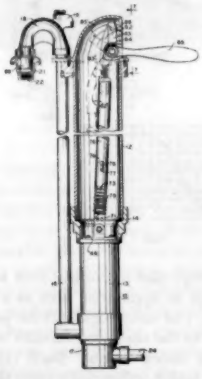
SANITARY FROSTPROOF HYDRANT

Joseph Kelso Murdock, and Eugene J. Riddle, both of Cincinnati, Ohio, assignors to Murdock Inc., Cincinnati, Ohio

Filed Dec. 23, 1968, Ser. No. 786,148

Int. Cl. E03b *9/14*; E03c *1/10*

U.S. Cl. 137—217 4 Claims



A sanitary and frostproof hydrant which includes a cylindrical housing having a valve controlled inlet opening at one end and a riser communicating with the interior of the housing at that end. A piston moves in the cylinder between a valve open position engaging the valve to open it and a water storage position spaced from said end of the cylinder in which riser water is stored in the cylinder.

3,770,001

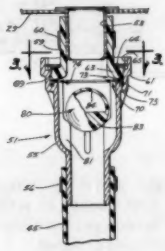
VALVE CONSTRUCTION

Gordon Jerry Davis, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa

Filed July 6, 1971, Ser. No. 159,824

Int. Cl. F16k *45/00*

U.S. Cl. 137—217 13 Claims



A valve construction including a thin pliable primary valve seat that will cooperate with a movable valve member to effect a seal responsive to extremely low urging forces and further including a secondary or backup seat juxtaposed to the primary seat and engageable thereby responsive to higher urging forces to maintain the seal at much higher back pressures.

3,770,002

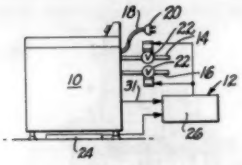
AUTOMATIC WATER SHUT-OFF SYSTEM

Lawrence C. Brown, 2302 Buenos Aires Drive, Covina, Calif.

Filed Nov. 1, 1971, Ser. No. 194,219

Int. Cl. H01h *35/00*; B08b *13/00*

U.S. Cl. 137—312 9 Claims



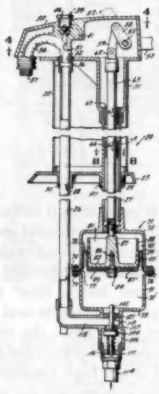
An automatic water shut-off system for an appliance such as an automatic washing machine, water heater or the like, for cutting off the water supply to the appliance in the event of a malfunction such as a leak or overflow which may cause flooding. A solenoid shut-off valve is connected in each appliance water inlet and controlled by a leak detection system including an electrical water sensor located adjacent the appliance so as to be wetted by water leaking or overflowing from the appliance. The valve is automatically closed in response to a change which occurs in an electrical characteristic of the sensor when wetted. In the disclosed embodiment, the sensor is a capacitor having porous wick material between the capacitor plates for inducing wetting of the plates by water contacting the capacitor. The detection system embodies an oscillator which controls a switch for closing the shut-off valve in response to the change in the sensor leakage resistance which occurs when the detector is wetted.

3,770,003

FROSTPROOF HYDRANT

Miroslav Uroshevich, Cincinnati, Ohio, assignor to Murdock Inc., Cincinnati, Ohio

Filed May 13, 1971, Ser. No. 142,968
Int. Cl. E03b 9/14
U.S. Cl. 137—281 4 Claims



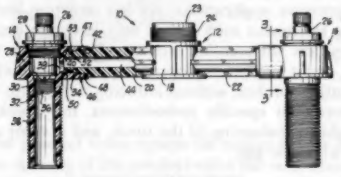
A frostproof hydrant having a riser and a chamber adjacent a lower end of the riser and below frost level. A flexible diaphragm divides the chamber into a pair of sections. A diaphragm actuator attached to the diaphragm is moved through the chamber in a direction away from a riser connection means to draw water from the riser into the chamber to be stored in the chamber below frost level when the hydrant is turned off. The diaphragm actuator advances the diaphragm through the chamber in an opposite direction to return the riser water to the riser.

3,770,004

MIXING VALVE ASSEMBLY

Tom W. Johnson, and Joe L. Johnson, both of Burton, Ohio, assignors to Sajar Plastics, Inc., Middlefield, Ohio

Continuation of Ser. No. 101,810, Dec. 28, 1970, abandoned. This application Mar. 12, 1972, Ser. No. 234,073
Int. Cl. F16k 19/00
U.S. Cl. 137—315 6 Claims



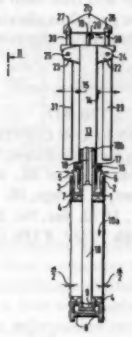
A mixing valve assembly constructed of plastic parts in which end pieces that form valve bodies receive the ends of conduits of a mixing chamber. Ends of the conduits are received in recesses of the end pieces, are secured by an adhesive or solvent, oriented by mating noncircular portions, and sealed by both the adhesive or solvent and an O-ring between each conduit and the connected end piece.

3,770,005

SHUT-OFF DEVICE, IN PARTICULAR, A HOT BLAST SLIDE VALVE

Jan Hendrik Brandenburg, Heemstede, Netherlands, assignor to Zimmermann & Jansen Gesellschaft mit beschrankter Haftung, Duren, Germany

Filed Mar. 10, 1972, Ser. No. 233,493
Int. Cl. F16k 49/00
U.S. Cl. 137—340 8 Claims



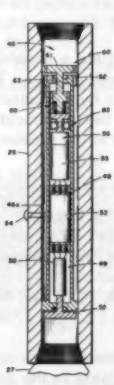
Summarizing, the present invention provides a shut-off device, in particular for superheated gases or a hot blast slide valve with a large diameter bore closable by a slide valve gate guided in a slot of the valve casing, the valve casing having at each axial end thereof a connection flange, the connection flanges being disposed relative to each other at an angle of one to a few degrees.

3,770,006

LOGGING-WHILE-DRILLING TOOL

James H. Sexton, Duncanville; Vasel R. Slover, Jr., Irving; Bobbie J. Patton, Dallas, and Wilton Gravley, Carrollton, all of Tex., assignors to Mobil Oil Corporation, New York City, N.Y.

Filed Aug. 2, 1972, Ser. No. 277,220
Int. Cl. G01v 1/40
U.S. Cl. 137—499 16 Claims



A logging-while-drilling tool which is adapted to be positioned within the drill string of a well drilling apparatus. The tool has a turbinelike, signal-generating valve which opens and closes at a defined rate to generate a pressure wave signal in the drilling fluid which is representative of a measured

downhole condition. The tool includes spring means to normally bias the rotor away from the stator of the valve. The force constant of the spring means is greater than the pressure drop across the rotor at low flow rates but is less than the pressure drop at the flow rate at which the tool begins operation. This allows the tool to maintain a large gap between the rotor and stator prior to operation of the tool or during periods of nonoperation thereby alleviating the problem of plugging and/or jamming of the valve. During normal operation the net force holding the rotor down, i.e., the force due to hydraulic pressure drop minus the spring force, is relatively small so that the rotor will ride up over and free itself from material which may become lodged in the gap, thus alleviating jamming of the valve. Also, structural features of the rotor aid in alleviating plugging of the valve.

3,770,007

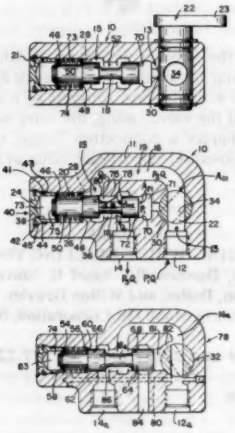
DUAL DIRECTION FLOW CONTROL VALVE

Harold R. Orth, Hinsdale; Kestutis Biskis, Downers Grove, and Rudolph E. Yeh, Elmhurst, all of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Apr. 21, 1972, Ser. No. 246,449

Int. Cl. F16k *17/22*; **F15b** *11/04*

U.S. Cl. 137—501 **9 Claims**



A control valve which has a variable orifice valve located across the pressure fluid passage. The resulting pressure change is communicated by a channel system to two power chambers which control the movement of a pressure compensating spool also located in the pressure fluid passage thereby regulating fluid flow.

3,770,008

RELIEF VALVE THAT SEALS AGAINST VACUUM

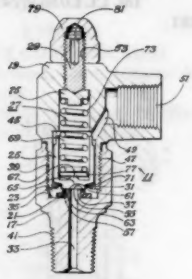
Larry R. Turney, Denton, Tex., assignor to Victor Equipment Company, Denton, Tex.

Filed Dec. 11, 1972, Ser. No. 313,971

Int. Cl. F16k *17/06*

U.S. Cl. 137—516.25 **4 Claims**

A relief valve that is reseatable to seal against high vacuum characterized by, in addition to the usual body and cap with conventional passageways, internal chamber, biasing means, and biasing adjustment means for effecting the relief valve action therewithin, a first resilient seat that is disposed circumferentially about a first passageway through the body and being designed to block flow in both directions when engaged by a seal surface; a first seat retainer removably holding the resilient seat in place and having a first annular seal surface; an upper seat reciprocally disposed within the internal chamber and having a seal surface at its lower end disposed adjacent the first resilient seat for sealing engagement therewith, the upper seat having a second annular seal surface



disposed opposite the first annular seal surface; and a vacuum supplemental seal means for supplemental sealing against high vacuum. The vacuum supplemental seal means is disposed intermediate the first and second annular seal surfaces so as to sealingly engage them and block flow toward the first passageway when the upper seat has its seal surface sealingly engaging the first resilient seat. Thus, the relief valve can be employed as a safety release on a pressurized vessel, yet allow the vessel to be operated under high vacuum with a leak rate of only about 2×10^{-10} cubic centimeters per second.

3,770,009

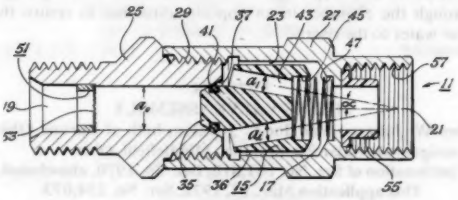
SENSITIVE CHECK VALVE

Richard W. Miller, Denton, Tex., assignor to Victor Equipment Company, Denton, Tex.

Filed Dec. 29, 1971, Ser. No. 213,383

Int. Cl. F16k *15/02*

U.S. Cl. 137—543.19 **6 Claims**



A check valve characterized by a lightweight valve member and a weak biasing spring such that it opens and reseats with a low differential pressure of only about three ounces per square inch thereacross, preferably less. The check valve may be used in high pressure applications, yet has structure and low engineering tolerances such that it may have the desired flow with very low differential pressure drop across the valve member, and it may be employed in applications such as welding or cutting torches, without inducing flutter into the flame of the torch. In specific embodiments, the check valve is lightweight for balancing of the torch, and is color coded for use with a specific gas.

3,770,010

WASHING MACHINE

Robert W. Raefield, Concord, Calif., assignor to Systems Enterprises Inc., Concord, Calif.

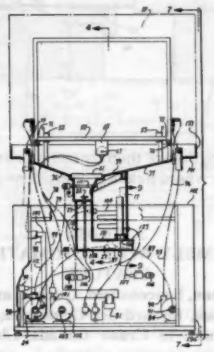
Filed Nov. 30, 1971, Ser. No. 203,150

Int. Cl. F17d *3/00*

U.S. Cl. 137—571 **10 Claims**

A washing machine for glassware and other utensils having a utensil chamber and wash and rinse cycles wherein wash and

rinse liquids are injected into the chamber and having a structural arrangement maintaining the separateness of the liquids while permitting storage and reuse of the wash liquid. The structure embodies a main basin for the wash liquid and an auxiliary basin mounted to recieve liquid runoff from the utensil chamber and to overflow into the main basin. The auxiliary basin is provided with a valved drain so as to provide such



overflow during the wash cycle thereby obtaining a recirculation of the wash liquid, and to provide when open and during the rinse cycle for a continuous draining of the auxiliary basin thereby preventing co-mingling of the wash and rinse liquids. During the rinse cycle, the wash liquid is held separately stored in the main basin for reuse in cleaning the next batch of utensils placed in the machine.

3,770,011

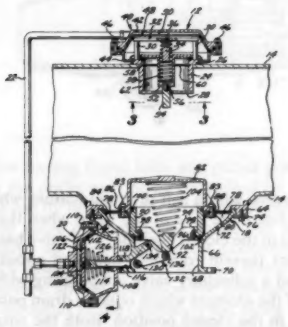
TANK VENT AND PRODUCT VALVE SYSTEM

Herman D. Muchl, 10851 Drury Lane, Lynwood, Calif.

Filed Feb. 5, 1973, Ser. No. 329,586

Int. Cl. F16k *45/00*

U.S. Cl. 137—587 **5 Claims**



A vent and product valve system for tanker trucks and the like. Prior to opening of the product valve the vent valve is automatically opened by a system whose operation is based in part upon spring loading and differential pressure areas in the valves. Filling pressure alone is insufficient to operate the product valve, enabling a plurality of product valves to be connected in parallel and sequentially operated to provide sequential filling of associated tanks. The power unit for operating each product valve is completely isolated from the product in the tank so that the valve components are not damaged by the product.

3,770,012

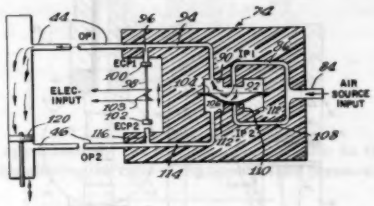
RANDOM ACCESS SELECTION APPARATUS

Donald L. Bitzer, Urbana; Lyle E. Bandy, Decatur; Roger L. Johnson, Monticello, and Dominic O. Skaperdas, Champaign, all of Ill., assignors to University of Illinois Foundation, Urbana, Ill.

Division of Ser. No. 195,884, Nov. 4, 1971, which is a division of Ser. No. 850,965, Aug. 18, 1969, Pat. No. 3,641,529. This application Feb. 5, 1973, Ser. No. 329,901

Int. Cl. F16k *11/10*

U.S. Cl. 137—596.16 **9 Claims**



Random access information retrieval apparatus for selecting a particular item from a plurality thereof including an improved pair of *x-y* coordinate digitally positionable devices which are driven by a four-way control valve. A polar coordinate random access information retrieval apparatus including a rotatable recording disc having information recorded on at least one surface thereof, a transducer for detecting said information, radial positioning means for moving said transducer radially along said disc, and angular positioning means coupled to said recording disc for incrementally rotating said disc to position desired information on said disc adjacent said transducer. An improved four-way control valve including a valve housing having a pair of inlet ports for connection to a pressure source and a pair of outlet ports for connection to a load, a first control chamber communicating one of said inlet ports with one of said outlet ports, a second control chamber immediately adjacent said first chamber and communicating the other of said inlet ports with the other of said outlet ports, a diaphragm intermediate said first and second chambers and forming a common wall therebetween, and a diaphragm control means for moving said diaphragm to selectively seal one of said inlet ports in said respective first and second chambers to control the fluid flow between said inlet and outlet ports.

3,770,013

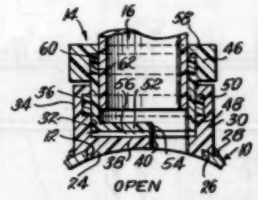
VALVE FOR USE IN DEWATERING SYSTEM

William F. Thompson, and George M. Thompson, both of P.O. Box 336, Port Orange, Fla.

Filed Dec. 6, 1971, Ser. No. 205,149

Int. Cl. F16l *29/00*

U.S. Cl. 137—606 **5 Claims**

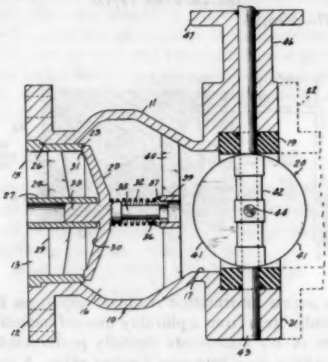


A dewatering system has a vacuum source with a collecting header and a series of wellpoints connected to the header by swing couplings. The wellpoints may be selectively operated through the use of valves interposed between the swing couplings and the header. The valves include selectively alignable openings with outwardly visible indicia correlated to the positions of the openings.

3,770,014
UNIDIRECTIONAL VARIABLE FLOW VALVE

Donald R. Limberg, Wilmette, Ill., assignor to The Metraflex Company, Chicago, Ill.

Filed Dec. 23, 1971, Ser. No. 211,588
Int. Cl. F16k *17/24*
U.S. Cl. 137—614.2 **9 Claims**

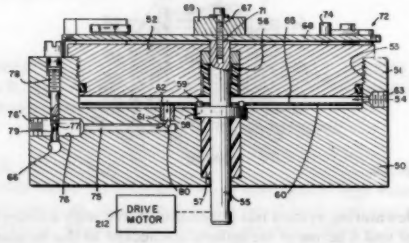


Unidirectional flow control valve and body in which the valve body has flanges at its opposite ends for connection in a pipeline, an inlet leading into the body through one flange, an aligned outlet leading from the body through the opposite flange, and a global flow expansion chamber between the flanges. A bronze insert in the inlet forms a guide and seat for a disk-type of check valve. A resilient insert in the outlet forms a seat for a butterfly type of flow control valve, the pivot of which extends diametrically through the resilient insert and flange in the valve body, and is so positioned that the butterfly valve when in a full open position may extend outside of the flange.

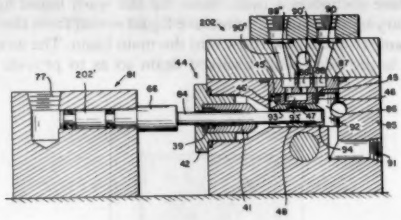
3,770,015
MANUFACTURE OF COMPOSITE MATERIALS

William M. B. Fitzgerald, Toronto, Ontario, Canada, assignor to Johnson, Matthey and Mallory, Ltd., Toronto, Canada

Division of Ser. No. 786,971, Dec. 26, 1968, Pat. No. 3,634,934, which is a continuation-in-part of Ser. No. 507,173, Nov. 10, 1965. This application Nov. 24, 1970, Ser. No. 92,330
Int. Cl. F15b *21/02*; **F01b** *25/26, 31/12*
U.S. Cl. 137—624.11 **6 Claims**



A welded composite formed by cutting and heating continuous lengths of wire and immediately transferring the lengths to a die where the lengths are joined by pressing at high pressure

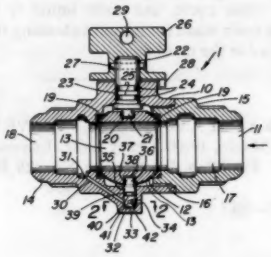


and the joined lengths are then forced at least a portion of the way out of the die where heading operations are performed.

3,770,016
VALVE ASSEMBLY WITH AUTOMATIC DRAINING FEATURE

Robert F. Johnstone, Beaconsfield, Quebec, and Kodandraman Balasubramanian, Dollard des Ormeaux, Quebec, both of Canada, assignors to Crane Canada Limited, Montreal, Canada

Filed Nov. 26, 1971, Ser. No. 202,405
Int. Cl. F16g *11/02*
U.S. Cl. 137—625.22 **7 Claims**



A rotatable valve with a self draining feature which allows water to drain from one side of the valve when the rotatable valve element is in the closed position. The valve has a housing with an element therein rotatably mounted about a central vertical axis and a subsidiary valve cooperating with the trunnion portion of the element which opens a drain passage when the element is in the closed position. Both the rotatable and subsidiary valves are operated from the same handle.

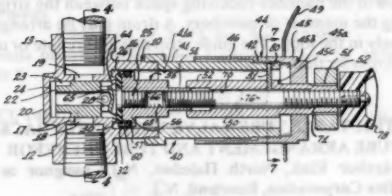
3,770,017
MIXING VALVE

Frank V. Enterante, 5142 Alhambra Ave., Los Angeles, Calif.

Filed Aug. 30, 1971, Ser. No. 175,961
Int. Cl. F16k *11/02*
U.S. Cl. 137—625.17 **4 Claims**

A mixture control hot and cold water valve, with one handle for volume control and one for mixture control, is described. A longitudinally ported, rotatable and axially movable valve plug, operable by two concentric stems, controls mixture by rotation of a valve element between hot and cold inlets, and

volume by axial travel between an open position and a closed position wherein a washer on the stem is engaged with a seat in the valve housing around the valve plug. The washer is on a washer-carrier having a screw threaded connection to the valve, and also to an inner stem member, whose extremity carries a volume control knob. A handle rotates the outer stem member through a limited arc to correspondingly rotate the valve plug and thus accomplish mixture control. A tubular



boss projects from the valve body around the stem means, and a barrel screwed thereto houses substantially the remainder of the stem means. A ferrule screwed onto this barrel acts through a packing to yieldingly resist rotation of an outer stem member relative to the barrel. Thus the outer stem member can be turned for mixture control. By taking off the handles, and screwing off the ferrule, the stems, together with washer-carrier and valve rotor can be pulled out of the valve body and the barrel for easy inspection or repair of the washer.

3,770,018

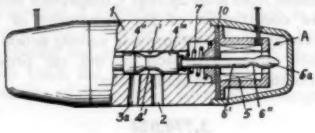
VALVE ASSEMBLY WITH LINEAR MOTORS

Nobuyuki Sugimura, 1416 Sodeshi-cho, Shimizu, Japan

Filed Sept. 13, 1971, Ser. No. 179,640

Int. Cl. F16k *11/07*

U.S. Cl. 137—625.42 **8 Claims**



A valve having liquid inlet and outlet ports; liquid flowing through the outlet port being controlled by a spool valve element moved by linear motors; one of the enlarged portions of the spool valve element being shaped as a cone to control liquid flow; an electrical current controller for voltage or frequency operatively connected to a stator of the respective linear motors; and an operation rod provided in the linear motor, the diameter of the operation rod being varied to vary the speed of the spool through variation of magnet forces.

3,770,019

CONTROL VALVE

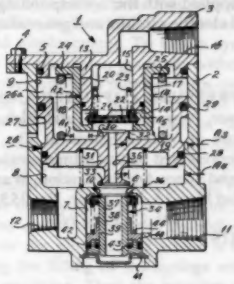
Raymond F. Steizer, Bel Nor, Mo., assignor to Wagner Electric Corporation, Newark, N.J.

Filed July 10, 1972, Ser. No. 270,484

Int. Cl. B60t *13/24*

U.S. Cl. 137—627.5 **17 Claims**

A control valve for varying fluid pressure applied to the vehicle front brakes in a braking system is provided with a control piston responsive to control fluid pressure for actuating a relay piston to establish the applied fluid pressure in a predetermined ratio, and a valve actuated by the control and relay pistons when the control fluid pressure acting on the control piston exceeds a predetermined value to effect a metered application of the control fluid pressure to the relay valve for altering the ratio of the applied fluid pressure.



3,770,020

INTERFACE DETECTOR

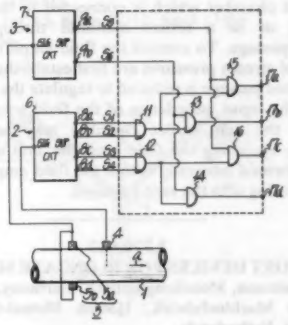
Kohzoh Tamura, Chigasaki, and Shigetoshi Matsuno, Yokohama, both of Japan, assignors to Kabushiki Kaisha Tokyo Keiki (Tokyo Keiki Co. Ltd.), Tokyo, Japan

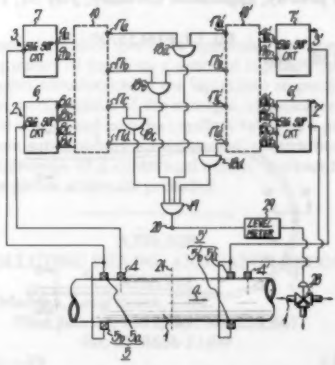
Filed May 2, 1972, Ser. No. 249,499

Claims priority, application Japan, May 13, 1971, 46/32097; May 22, 1971, 46/35085

Int. Cl. G01r *27/26*

U.S. Cl. 137—802 **6 Claims**





An interface detector having a common supply pipe through which different kinds of liquids are supplied, at least

two detecting devices mounted on the pipe, at least two electric circuits supplied with signals from the detecting devices and delivering corresponding signals, and electric circuits connected to be supplied with the corresponding signals from the first mentioned electric circuits and generating output signals.

3,770,021

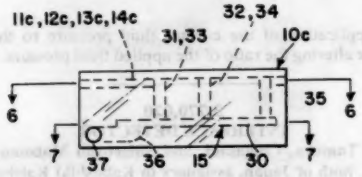
FLUID PRESSURE AMPLIFIER AND SYSTEM

Howell D. Garner, Newport News, and Richard F. Hellbaum, Hampton, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 15, 1972, Ser. No. 253,249

Int. Cl. F15c *1/14*

U.S. Cl. 137—819 **2 Claims**



A flueric beam-deflection amplifier and a method of controlling the same wherein either a single or a series of cascaded fluid amplifier units are provided and each one of which may include the usual power nozzle, control nozzles, outlet passages and vent passages. In the present disclosure, all vent passages of each fluid amplifier unit lead to an enclosed vent outlet chamber which is connected to the ambient environment or to a return manifold through a variably restricted passage. To control the fluid amplifier unit, power and control stream pressures are first established, after which the restricted passage is reduced to regulate the input bias, the gain and the input impedance of the fluid amplifier unit. As examples, the vent outlet chamber may be a container completely enclosing the fluid amplifier unit or an enclosed chamber formed integrally within the fluid amplifier unit and communicating with the vent passages.

3,770,022

SUPPORT DEVICES FOR ELONGATE MEMBERS

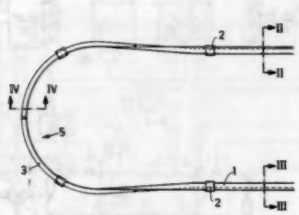
Heinz Beisemann, Monchengladbach, Germany, assignor to P. Konings Machinefabriek, Ijzeren Metaal-Gieterij N.V., Swalmen, Netherlands

Filed Oct. 6, 1970, Ser. No. 78,475

Claims priority, application Germany, July 31, 1970, P 20 38 147.9

Int. Cl. F16l *55/00*

U.S. Cl. 138—108 **7 Claims**



A support device for running at least one flexible elongate member, such as a cable, pipe or the like, from a fixed station to a station movable with respect to the fixed station provides an open-ended loop region between the fixed and movable stations. It includes a guide strip defining a path for the member. The relaxed cross-section of the guide strip has a curved profile providing longitudinal stiffening to resist bending of the strip away from its longitudinal axis. The strip is elastically deformable, however, to assume a flattened cross-section in the loop region. In an open form of device, the elongate members are held on to the strip by spaced clips or elastic bands. In a closed form of device the elongate members are held in a space between the guide strip and an auxiliary guide strip running along it. In this closed form, seals may be provided along the mating edges of the strips, and spacers may be included in the member-receiving space between the strips for locating the member or members. A drum may be arranged to lie loosely in the loop. The guide strip may be arcuate or undulant in cross section.

3,770,023

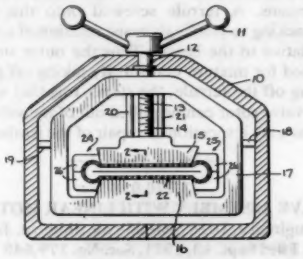
CONSTRICTABLE TUBE VALVE WITH ANTI-CRACKING TUBE ARRANGEMENT AND TUBE THEREFOR

Helm Arthur Rink, North Haledon, N.J., assignor to Resistoflex Corporation, Roseland, N.J.

Filed Dec. 15, 1971, Ser. No. 208,279

Int. Cl. F16l *11/00*

U.S. Cl. 138—121 **7 Claims**



An internal circumferential rib is provided on the inner surface of a tube of inelastic crack sensitive resin. The side edges of the tube coinciding with the rib are clamped in folded condition to establish fluid seals thereat. Compressor members effect selective constriction of the remainder of the tube between the clamped edges to provide valving action in a constrictable tube valve. Provision of the rib prevents the development of through-the-wall cracks.

3,770,024

SLEY

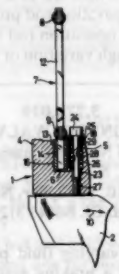
Erwin Pfarrwaller, Winterthur, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed July 13, 1971, Ser. No. 162,081

Claims priority, application Switzerland, July 13, 1970, 10563/70

Int. Cl. D03d *49/60*

U.S. Cl. 139—188 **13 Claims**



The sley secures the reed in place by means of one or more clamping members disposed in the groove-shaped indentation

alongside the reed. The clamping members can be of wedge like construction to clamp the reed in place or can be of a deformable material which is deformed so as to clamp the reed in place. The clamping members can also be spring loaded to ensure a sufficient clamping force on the reed.

3,770,025

WIRE-LOOP STACKER

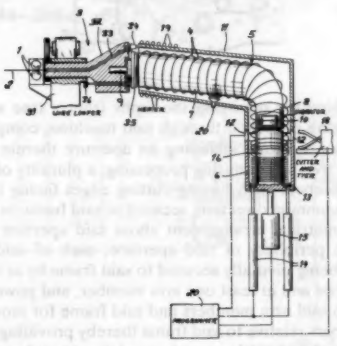
Horst-Dieter Hirschfelder, Langenfeld, and Rene Marzinkewitsch, Mulheim/Ruhr, both of Germany, assignors to Fried Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Dec. 27, 1971, Ser. No. 211,984

Claims priority, application Germany, Dec. 28, 1970, P 20 64 049.7

Int. Cl. B21f *3/02*

U.S. Cl. 140—2 **10 Claims**



Helicoidally wound wire coming hot from a looping machine is fed axially onto a vibrating elbow-shaped mandrel with a slightly downwardly sloping entrance leg and a vertically decending exit leg. The turns of the looped wire leaving the mandrel are deposited on a verticlly movable annular platform, surrounding a cylindrical core, which is periodically raised to compress a number of turns aginst lugs swung in laterally between the mandrel and the core. A cutting and tying device binds the compressed turns into a coil which, upon a lowering of the core, is laterally discharged from the platform.

3,770,026

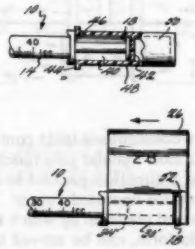
APPARATUS AND METHOD FOR ACCURATELY LOADING SYRINGES

Joel Saul Isenberg, 9485 E. Orchard Dr., Englewood, Colo.

Filed Sept. 17, 1971, Ser. No. 181,448

Int. Cl. B65b *1/16*; A61m *5/18*; B65b *31/08*

U.S. Cl. 141—2 **10 Claims**



A gage set is provided for loading various types of conventional hypodermic syringes. The gages comprise, in a first embodiment, a member having opposed parallel faces displaced from one another by a perpendicular edge having a notch formed therein which is sized to receive the plunger shaft of the syringe. This member may be formed as a single unit or of a number of smaller units which are fastened together to create the desired displacement. To load a syringe using the first embodiment the plunger is gradually withdrawn by pushing with the member until the member slips over the plunger shaft and then the plunger is pushed in until the member is trapped between and engages the barrel flange and the plunger disk. In a second embodiment the gage comprises a hollow member having a closed end and an open end defined by a lip to be parallel to the closed end, said open end being adapted to receive the plunger disk but not the barrel flange of the syringe. In the use of the second embodiment, the open end is slipped over the plunger disk which is in an extended position following the filling of the syringe with an approximate amount of medicine. Then the member is pressed until the lip engages the barrel flange. In a third embodiment the gage is composed of a member similar to the first embodiment but with a gap or notch essentially parallel to the opposed parallel faces to receive the plunger disk thus requiring minimal manual dexterity to use. The gage in any embodiment may contain indicia of the make and model of syringe with which it should only be used, the amount of medication which it will load, and further may be color coded for type of medication.

3,770,027

MANIFOLD LIQUID DISTRIBUTOR

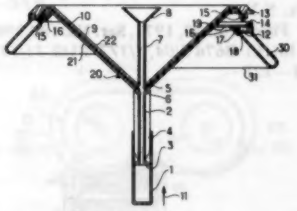
Jean Guigan, 9 rue Jean Mermoz, Paris, France

Filed Jan. 7, 1972, Ser. No. 216,050

Claims priority, application France, Jan. 7, 1971, 7100378; Feb. 24, 1971, 7106311

Int. Cl. B65b *37/12*; B01l *11/00*

U.S. Cl. 141—34 **20 Claims**



The present invention provides apparatus for removing a measured quantity of liquid by a series of capillary tubes with the subsequent introduction of the liquid into respective work tubes for the performance of, for example, chemical reactions. The liquid is introduced into the capillary tubes by a piston action and then subsequently forced passed a restrictive orifice under the influence of a centrifugal action. Various forms of creating the piston action are provided.

3,770,028

ANTI-POLLUTING FILLING AND VAPOR RECOVERY SYSTEM

Michael J. Madden, Long Beach, Calif.

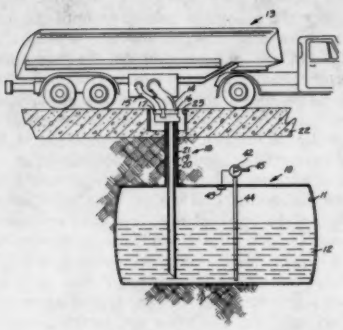
Filed Jan. 26, 1972, Ser. No. 220,867

Int. Cl. B65b *31/00*

U.S. Cl. 141—59 **11 Claims**

A filling and vapor recovery system, adapted for use during the filling of underground gasoline storage tanks, comprises concentric conduits extending downwardly from ground level to communicate with the tank's chamber. The inner conduit is

a fill tube terminating at its upper, inlet end at a removable fill cap and defines a cylindrical vapor passage with the outer conduit. The upper end of the outer conduit has a tee-fitting attached thereto having a check valve mounted at its outlet.



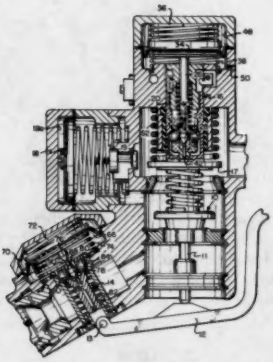
When the tank is filled with gasoline from a delivery truck, through the fill tube, the outlet of the fitting is attached to a return hose which automatically opens the valve to communicate gasoline vapors to the truck from the tank.

3,770,029

AUTOMATIC FUEL DISPENSING NOZZLE

Edward A. Mayer, Beacon, N.Y., assignor to Texaco Inc., New York, N.Y.

Filed Sept. 30, 1971, Ser. No. 184,998
Int. Cl. B67d *5/04, 5/377;* **F16k** *31/145*
U.S. Cl. 141—128 **5 Claims**



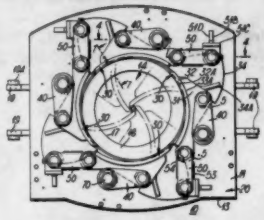
An automatic dispensing nozzle for filling a vehicle tank having a control valve automatically responsive both to the rise of fluid around the outlet spout of the nozzle and also to abnormal increase in pressure within the vehicle tank to release a lockout mechanism which effects cut-off of the valve, involving a central, axially movable control pin for controlling a valve lockout mechanism.

3,770,030

DELIMBER

Robert Miklos Palfy, Laval Des Rapides, Quebec, Canada, assignor to Logging Development Corporation, Montreal, Quebec, Canada

Filed Mar. 7, 1972, Ser. No. 232,398
Claims priority, application Canada, Mar. 9, 1971, 107262
Int. Cl. A01g *23/00*
U.S. Cl. 144—2 Z **9 Claims**



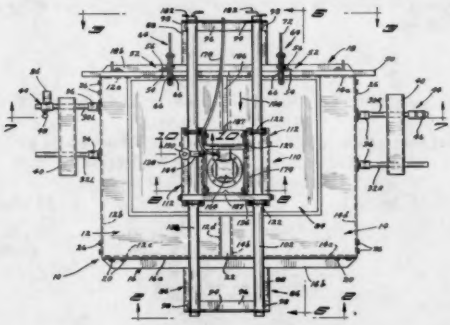
A machine for removing the limbs from a tree while the same is being propelled through said machine, comprising in combination a frame including an aperture therein through which the tree passes during processing, a plurality of arcuate cutting members each having cutting edges facing in a substantially common direction, secured to said frame in substantially symmetrical arrangement about said aperture and adjacent the periphery of said aperture, each of said cutting members being pivotally secured to said frame by at least one link member and at least one arm member, and power means secured to said arm members and said frame for moving said arm members relative to said frame thereby providing traverse movement of said cutting members relative to said aperture.

3,770,031

ROUTING FIXTURE

Eugene T. Olson, 13460 North Highway 65, Route 4, Anoka, Minn.

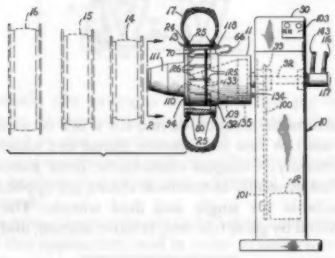
Filed Mar. 3, 1972, Ser. No. 231,497
Int. Cl. B27c *5/02*
U.S. Cl. 144—136 R **20 Claims**



The routing fixture constitutes a table comprised of two flat panels separated by a slot. Tubular rails function as a track for guiding a carriage in a direction parallel to the slot, the carriage supporting a motor-operated router. The carriage includes a handle-actuated platform by which the router, which is attached to the platform, can be moved toward and away from the slot. The insertion or removal of shims permits thicker or thinner stock, as the case may be, to be worked on. Specially designed clamps hold the stock or work in a fixed relationship while the carriage and the router are moved rela-

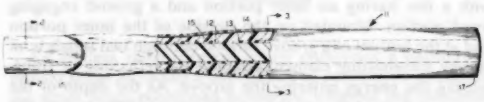
tive thereto; another specially designed clamp holds the carriage fixed when the stock or work is to be moved relative to the carriage. The carriage is mounted for virtually frictionless movement by reason of certain bearings associated with the supporting of the carriage. Lateral extensions enable relatively large pieces of work to be accommodated on the table or fixture. Various bolts are employed for holding the table together so that it can be easily shipped in a disassembled condition and then assembled by the purchaser.

3,770,032
RADIALLY EXPANSIBLE TIRE SUPPORTING APPARATUS
John A. Stull, La Mirada, Calif., assignor to James A. Smyser, Bakersfield, Calif.
Continuation-in-part of Ser. No. 388,518, Aug. 10, 1964, abandoned. This application May 4, 1967, Ser. No. 641,104
Int. Cl. B60c *25/00*
U.S. Cl. 144—288 A **3 Claims**



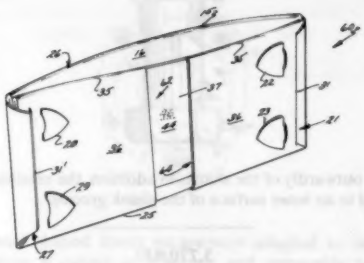
A radially expansible tire supporting apparatus having a plurality of radially disposed spokes, arcuate rim segments individual to the spokes disposed in annular arrangement to define a tire receiving rim, and means for correspondingly radially extending and retracting the spokes to effect controlled expansion and contraction of the rim, the rim segments being releasably mounted on their respective spokes and being provided in sets of different diameters to accommodate corresponding tires of different sizes.

3,770,033
MOLDED HANDLE FOR IMPACT TOOLS
Charles R. Gavillet, Carthage, Ill.; Dale L. Hagmeier, and Gregory K. Harris, both of Keokuk, Iowa
Filed Dec. 10, 1971, Ser. No. 206,678
Int. Cl. B25g *1/10*
U.S. Cl. 145—61 C **4 Claims**



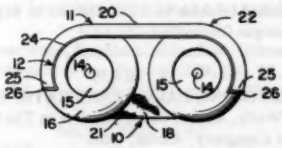
The disclosure concerns easily replaceable handles for impact tools, such as hammers, axes and sledges, which comprise a molded body made of a rigid structural plastic foam, and a reinforcing core made of a higher strength material.

3,770,034
WALLET
Verne G. Eastman, 5125 Cisne, S.W., Wyoming, Mich.
Filed June 9, 1971, Ser. No. 151,308
Int. Cl. A45c *1/06*
U.S. Cl. 150—38 **4 Claims**



A wallet is provided which requires no stitching or seaming during manufacturing. The wallet is assembled by folding a blank pattern of material cut or stamped from leather or the like and inserting locking tabs provided on the blank through associated slots to form the completed wallet. The wallet can be folded such that either side of the material forms the visible surfaces of the wallet. The sides of the material may be of different textures or colors to provide a unique wallet that is relatively inexpensive to manufacture and which has the feature of being reversible.

3,770,035
SKIRTED TANDEM-WHEEL COVER
Stanley V. Haye, Sr., 418 E. Nordin Ave., Spokane, Wash.
Filed Sept. 24, 1971, Ser. No. 183,427
Int. Cl. B60b *7/04*
U.S. Cl. 150—54 B **3 Claims**

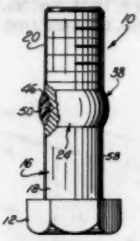


A cover for adjacent tandem wheels, especially as used on travel trailers, to shield against sun-rays or other physical deteriorants and improve appearance. A flexible, fabric-like planar facing member covers the outer surface and communicates with a fastening band having an elasticized inner edge to extend over the periphery of tires to be covered and around more than the upper half thereof to maintain positioning but allow simple installation.

3,770,036
FASTENER
Russell G. Sherman, Santa Monica, Calif., assignor to The Lamson & Sessions Co., Cleveland, Ohio
Filed Jan. 31, 1972, Ser. No. 221,931
Int. Cl. F16b *39/34*
U.S. Cl. 151—41.7 **4 Claims**

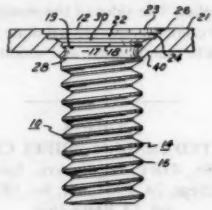
An improved fastener includes a shank having a retaining ring of nylon or other polymeric material. As the fastener is inserted into the hole in the receiving member, the leading surface of a bulge formed by the retaining ring is pressed radially and axially inwardly to compress the retaining ring with a camming action. To prevent the retaining ring from being rolled or otherwise forced out of a groove in the shank under the influence of camming forces, the retaining ring has a non-

circular cross sectional configuration with an axial dimension which is greater than the extent to which the retaining ring



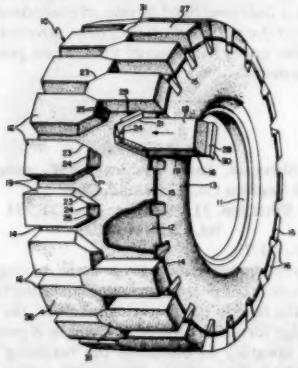
bulges outwardly of the shank. In addition, the retaining ring is bonded to an inner surface of the shank groove.

3,770,037
SELF-CLINCHING STUD WITH A MODIFIED HEAD
Richard B. Ernest, Richboro, Pa., assignor to Penn Engineering & Manufacturing Corp., Danboro, Pa.
Filed Dec. 15, 1971, Ser. No. 208,134
Int. Cl. F16b *39/282*
U.S. Cl. 151—41.73 **10 Claims**



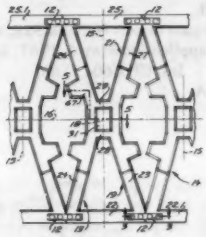
A self-clinching stud to be embedded into thin sheeted material is provided with a head comprising two non-circular members rotated relative to each other so as to provide for resistance to torque forces.

3,770,038
RELUGGING LARGE PNEUMATIC TIRES
Merritt W. Wolfe, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Division of Ser. No. 885,254, Dec. 15, 1969, Pat. No. 3,703,433. This application June 28, 1972, Ser. No. 266,856
Int. Cl. B60c *11/04*
U.S. Cl. 152—209 **8 Claims**



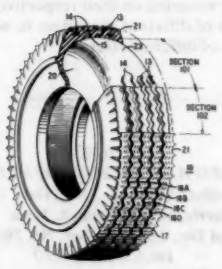
A method of relugging large off-the-road pneumatic tires in which an interlocking relationship is provided among the lugs resulting in a continuous circumferential rib and a tread pattern having improved resistance to driving, breaking and turning torques.

3,770,039
ELASTOMERIC TRACTION DEVICE
Rolf Pfoertner, 2176 E. 28th Ave., Vancouver, B. C., Canada
Filed Sept. 1, 1971, Ser. No. 177,004
Claims priority, application Canada, July 20, 1971, 118591
Int. Cl. B60c *27/00*
U.S. Cl. 152—221 **2 Claims**



An elastomeric traction device for a tire of an automotive vehicle, used in lieu of common metal tire chains or snow tires. Generally X-shaped elastomeric links joined together and applied generally as common chains are applied. Embodiments suitable for single and dual wheels. The device is characterized by good traction, relative silence, and long life.

3,770,040
TIRE WITH SAFETY INDICATOR MEANS
Marie Augusta De Cicco, 15 Rosella Ave., Cranford, N.J.
Filed Sept. 15, 1971, Ser. No. 180,571
Int. Cl. B60c *11/00*
U.S. Cl. 152—330 **17 Claims**



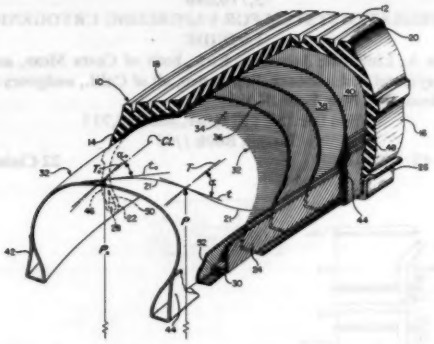
A tire safety indicator arrangement is shown in conjunction with a tire having an inner portion and a ground engaging tread portion. Mounted on the outside of the inner portion and at the bottom of a groove formed between two treads is an energy transmitting element adapted for reflecting or transmitting the energy entering the groove. As the depth of the groove is shorted due to the wearing away of the treads, the amount of energy entering the groove increases to a point where the reflective or transmitting properties of the groove element enable a viewer to observe the worn condition. Several tread designs are shown and several methods are disclosed for dynamically performing safety checks on a tire having the safety indicator therein.

3,770,041

CORD REINFORCED PNEUMATIC TIRE HAVING A SPECIAL CORD ANGLE RELATIONSHIP

John R. Abbott, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire and Rubber Company, Akron, Ohio

Filed Feb. 28, 1972, Ser. No. 229,923
Int. Cl. B60c 9/06
U.S. Cl. 152—356 20 Claims



A pneumatic tire having a carcass of bias ply cord reinforced fabric characterized by the cord path of the fabric being defined by the equation $\rho \cos^{\lambda} \alpha = K$. Tires are disclosed having a special cord path, as well as specified reinforcing layers beneath the tread and additional plies extending about the beads.

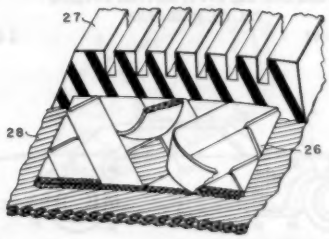
The foregoing abstract is not to be taken as limiting the invention of this application, and in order to understand the full nature and extent of the technical disclosure of this application, reference must be made to the accompanying drawings and the following detailed description.

3,770,042

ENDLESS REINFORCEMENT AND METHOD FOR PRODUCING SAME

Charles W. Greene, and George C. Varner, both of Spartanburg, S.C., assignors to Deering Milliken Research Corporation, Spartanburg, S.C.

Division of Ser. No. 90,560, Oct. 18, 1970, Pat. No. 3,720,570. This application Oct. 13, 1972, Ser. No. 297,508
Int. Cl. B60c 9/20
U.S. Cl. 152—361 R 1 Claim



An endless reinforcement which comprises a plurality of unitary strips including a multiplicity of continuous cords with the strips being positioned across the width of the reinforcement from one side to the other at opposing angles to the edges of the reinforcement with successive lengths of the strips being folded with respect to each other at the edges to form a generally zigzag pattern. Also, a method for producing such a reinforcement and a tire therewith as well as the resulting tire.

3,770,043

INSECT ESCAPEMENT FOR SCREENS

Harry F. Buckner, 5655 Gulley, Dearborn Heights, Mich.

Filed Aug. 7, 1972, Ser. No. 278,576
Int. Cl. E06b 9/52
U.S. Cl. 160—16 1 Claim

A funnel shaped insect escapement adapted to be positioned over a cutout in a screen and removably secured thereon.

3,770,044

METHOD OF DEWAXING SHELL MOLDS

Russel V. Heath, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 7, 1972, Ser. No. 224,328
Int. Cl. B22c 9/04
U.S. Cl. 164—35 3 Claims

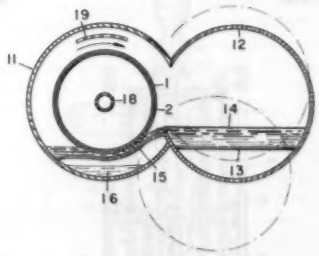
Refractory shell molds are made by a method including the steps of forming a shell investment mold over a wax pattern, freezing the mold and pattern to a temperature in the vicinity of about −100° F. whereby the pattern shrinks more than the mold to provide a slight gap between the pattern and the mold and then immediately placing the mold and pattern in a heated environment whereby the pattern is removed by melting without cracking or otherwise damaging the mold.

3,770,045

METHOD OF MAKING INTERNALLY LINED STEEL CYLINDERS

Franz D. Timmermans, Goethestr. 11a, Kiel, Germany

Continuation-in-part of Ser. No. 767,589, Oct. 11, 1968, Pat. No. 3,651,109. This application Jan. 21, 1972, Ser. No. 217,366
Int. Cl. B22d 13/00
U.S. Cl. 164—118 9 Claims



A process for lining steel cylinders with a relatively soft bearing metal such as lead bronze. The lined steel cylinders are intended as a material for manufacturing bearings, or bearing half-shells. The lining process of the steel cylinders is automated and the cooling of the lined steel cylinders while still incandescent is effected by means of a melted metal having a relatively low melting point, operating as a cooling medium and reducing the temperature of the internally lined steel cylinders at a very rapid rate.

3,770,046

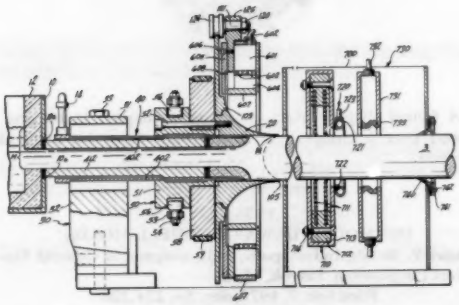
APPARATUS FOR COOLING A STRESS SENSITIVE CONTINUOUS CASTING

James E. Dore, Milford, Conn., and William O. Stauffer, Woodfield, Ohio, assignors to Olin Corporation, New Haven, Conn.

Division of Ser. No. 768,354, Oct. 17, 1968, Pat. No. 3,598,173. This application Mar. 19, 1971, Ser. No. 126,130The portion of the term of this patent subsequent to Aug. 10, 1988, has been disclaimed.

Int. Cl. B22d *11/12*

U.S. Cl. 164—283 **13 Claims**



An apparatus for cooling a stress sensitive continuous casting emerging from a mold. The apparatus is particularly applicable to aluminum base alloys when cast in the horizontal mode. The apparatus includes means for applying a first cooling medium to an outer surface of the mold and the emergent portion of the casting; means for removing the first cooling medium from the casting; means spaced from the removing means for applying a second cooling medium to the casting; and means for removing the second cooling medium.

3,770,047

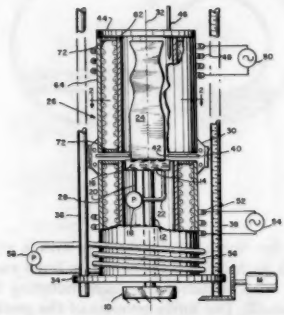
APPARATUS FOR UNIDIRECTIONALLY SOLIDIFYING METALS

Milton E. Kirkpatrick, Palos Verdes, Calif.; Thomas S. Piwonka, North Canton, Ohio, and Bruce D. Marcus, Los Angeles, Calif., assignors to TRW, Redondo Beach, Calif.

Continuation of Ser. No. 34,415, May 4, 1970, abandoned. This application Jan. 10, 1972, Ser. No. 216,736

Int. Cl. B22d *27/04, 25/06*

U.S. Cl. 164—338 **8 Claims**



A pair of annular heat pipes are arranged end-to-end around a casting mold. One of the heat pipes is heated above the liquidus temperature of the alloy to be cast, while the other heat pipe is heated below the solidus temperature of the alloy. A chill is placed at one end of the mold to cool the alloy unidirectionally. A sharp temperature gradient that is virtually a step function is produced at the junction of the two heat pipes which results in greater control over the region of solidification of the alloy as the heat pipes are moved to cool and solidify the alloy.

3,770,048

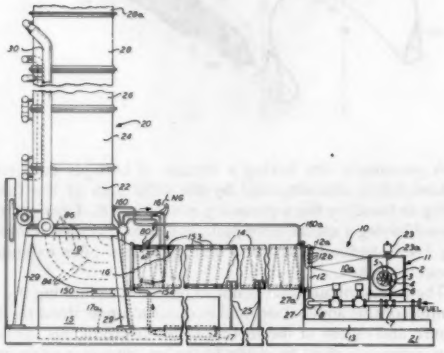
INTEGRATED SYSTEM FOR VAPORIZING CRYOGENIC LIQUIDS

Hans A. Linhardt; James A. Kirk, both of Costa Mesa, and Raymond E. Lancaster, San Pedro, all of Calif., assignors to Airco, Inc., New York, N.Y.

Filed Dec. 22, 1971, Ser. No. 210,713

Int. Cl. B60h *1/00*

U.S. Cl. 165—1 **22 Claims**



An integrated system for vaporizing cryogenic liquids including a fuel burner for generating hot combustion gases. The gases are directed into a mixing chamber and contacted with a spray of water for producing a heat transfer gas-steam mixture. The mixture is allowed to indirectly heat the cryogenic liquid and condensate formed is recycled for mixing. The firing rate of the burner is controlled in response to the temperature of the gas-steam mixture exhaust.

3,770,049

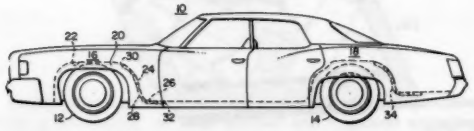
VEHICLE COOLING SYSTEM

Clarence Wright, Route 1, Box 248, Fairmont, W.Va.

Filed Oct. 22, 1971, Ser. No. 191,596

Int. Cl. B60h *3/00*

U.S. Cl. 165—41 **2 Claims**



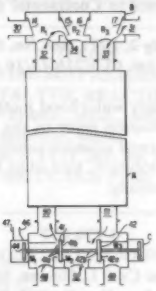
Radiating means which reduces the temperature of the fluid coolant and melts, or prevents the accumulation of, ice and like compositions on the fender surfaces of the vehicle. Radiating means is positioned adjacent to the fender surfaces and connected to the fluid coolant of the engine by suitable tubing members. Valves placed in the tubing members may be used to regulate the flow of coolant through the radiating means.

3,770,050

REVERSING HEAT EXCHANGER UNIT

Sadayuki Nakanishi, Kobe, Japan, assignor to Kobe Steel, Ltd., Fukiai-ku, Kobe, Japan

Filed July 15, 1971, Ser. No. 162,835
Int. Cl. F28f *27/02*
U.S. Cl. 165—97 **5 Claims**



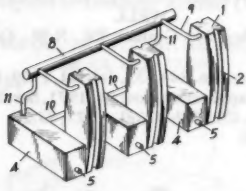
A reversing heat exchanger system not divided into the usual blocks and having change-over valves and check valves provided in each reversing heat exchanger unit to unify them and thereby to prevent the loss of raw air upon exchange of raw air and waste gas paths, to prevent abrupt pressure changes, to enable stable operation of a rectification system, and to standardize the change-over valves and check valves in order to facilitate easy design and manufacturing of the reversing heat exchanger system.

3,770,051

APPARATUS FOR HEAT TREATMENT OF SYNTHETIC FIBRE YARN

Nobuhisa Kodaira, 1–10, 1-chome, Shoan Suzinami-ku, Tokyo, Japan

Filed Mar. 29, 1972, Ser. No. 239,204
Int. Cl. D02j *13/00*; F26b *13/02*
U.S. Cl. 165—105 **10 Claims**



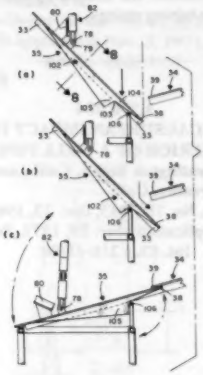
Heat treatment apparatus for synthetic fiber yarn including a plurality of spaced heating units, each unit including a vertically positioned closed vessel having a longitudinally positioned heater chamber. Liquid in the chamber, when heated, produces a heated vapor in the vessel for heating the exterior yarn contacting faces fixed thereon. The heater chambers are interconnected such that a uniform temperature is maintained in each of the heating units. The units are interconnected by flexible conduits or pipes to allow the spacing between the heating units to be conveniently adjusted.

3,770,052

INSTALLATION OF UNDERWATER POLLUTION CONTROL APPARATUS

Thomas W. Childers, Woodland Hills, Calif., assignor to Esso Production Research Company, Houston, Tex.

Continuation-in-part of Ser. No. 174, Jan. 2, 1970, Pat. No. 3,670,814. This application May 17, 1972, Ser. No. 254,122
Int. Cl. E21b *43/01*
U.S. Cl. 166—.5 **6 Claims**



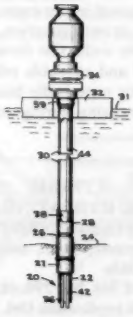
A process for installing and forming an inverted drip pan over an underwater wellhead and its associated production manifold. One part of the pan is fixed above the production manifold, and another part of the pan is removably secured over the wellhead by use of means on the wellhead roof for coacting with a remotely operated running-in device for removably installing and retrieving such roof part.

3,770,053

OCEAN BOTTOM WELL TUBING VALVE INSTALLATION

Don Leo Martin, Houston, and Jack Kenneth Sarver, Humble, both of Tex., assignors to FMC Corporation, San Jose, Calif.

Filed Dec. 14, 1971, Ser. No. 207,815
Int. Cl. E21b *33/035*
U.S. Cl. 166—.5 **14 Claims**



A method for completing an offshore well with tubing strings having full opening valves at the ocean floor or mudline, and one style of apparatus that can be used for carrying out the method. The method generally involves running and setting the tubing strings in a hanger at the ocean floor or mudline, and then continuing the strings to the surface well-

head by means of tubing extensions that are fitted with remotely controllable valves at the lower ends. The tubing extensions are releasably connected to the tubing strings so that the extensions and the valves can be removed and reinstalled as an assembly, such as for servicing or replacing the valves, without also having to remove the tubing strings or their hanger from the well. The described apparatus includes a tie-back adapter for connecting a riser to the innermost casing hanger in an underwater well at the mudline, a master bushing that supports the tubing strings inside the tie-back adapter, and a tie-back mechanism for releasably connecting the tubing extensions to the tubing strings.

3,770,054

APPARATUS FOR CAUSING AN IMPACT FORCE ON THE INTERIOR OF A WELL PIPE

James R. Solum, Huntington Beach, Calif., assignor to B & W Incorporated, Torrance, Calif.

Division of Ser. No. 786,283, Dec. 23, 1968, Pat. No. 3,661,209. This application Mar. 29, 1971, Ser. No. 129,274
Int. Cl. E21b *43/04*
U.S. Cl. 166—177 **11 Claims**

An apparatus for compactly placing a material such as gravel in a well bore exteriorly of a casing at a substantial depth by vibrating the stationary casing through the use of one or more devices positioned in the casing that are actuated by manipulation, rotation or reciprocation, of a drill pipe extending to the surface of the well. The device includes a member which is spring biased and movable relative to the drill pipe with a latch element for repeatedly biasing and releasing the member to impact the casing during continued manipulation of the drill pipe.

3,770,055

FILM FORMING HYDRAZINE-CONTAINING CORROSION INHIBITOR

Arthur Lee Larsen, Denver, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Continuation-in-part of Ser. No. 790,485, Jan. 10, 1969, Pat. No. 3,645,896. This application Oct. 29, 1971, Ser. No. 194, 009. The portion of the term of this patent subsequent to Feb. 28, 1989, has been disclaimed.
Int. Cl. C23f *11/14, 11/08*
U.S. Cl. 166—244 C **9 Claims**

Corrosion rates in oil wells are reduced by injecting the combination of about 2–200 ppm. of a film-forming nitrogen-containing corrosion inhibitor (e.g. an imidazoline compound) and about 0.01–1.0 ppm. of residual hydrazine, the ppm. based on water either produced or injected through the well, e.g. water produced in a gas lift well or water injected into an injection well. Such is especially useful with water injection wells, gas lift wells, etc.

3,770,056

METHOD OF INCREASING RECOVERY OF PETROLEUM FROM SUBTERRANEAN FORMATIONS

David W. Campbell, and Robert R. Matthews, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed July 2, 1971, Ser. No. 159,522
Int. Cl. E21b *43/16*
U.S. Cl. 166—273 **4 Claims**

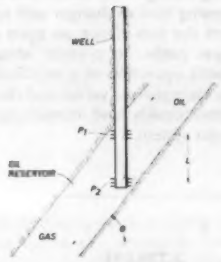
Tertiary or secondary waterflood method wherein there is injected into the formation prior to the main aqueous drive fluid a slug of a thickened aqueous solution and a slug of concentrated surfactant solution, said slugs being injected either as a mixture or sequentially.

3,770,057

CONTINUOUS ATTIC FLOODING

Harold A. Palmer, and Cecil L. Herren, both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Feb. 14, 1972, Ser. No. 225,927
Int. Cl. E21b *43/16*
U.S. Cl. 166—306 **4 Claims**



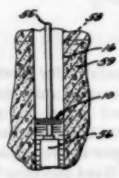
A method for recovering oil is provided wherein gas is injected into a well and oil is produced from the same well simultaneously by injecting the gas through upper perforations in the well at or below a critical rate and producing a volumetrically equal amount of oil through lower perforations in the same well.

3,770,058

METHOD OF INTRODUCING FLUID TREATMENT TO A WELL

William L. Smedley, 245 Graham Rd., N.W., Grand Rapids, Mich.

Division of Ser. No. 844,333, July 24, 1969, Pat. No. 3,647,230. This application June 21, 1971, Ser. No. 155,139
Int. Cl. E21b *43/00, 43/25, 43/27*
U.S. Cl. 166—310 **3 Claims**



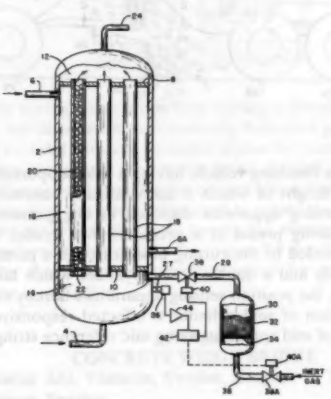
The disclosure is of a seal to be used in a well immediately above a pump and at or below the normal level of the water in

the well casing to prevent the movement of water and air downwardly past the seal into the area of the pump. The seal is designed to permit the necessary service connections to be passed through it and then adjusted to tightly seal about these connections before installation of the seal in the well. A chemical treatment conduit extends from the surface of the well through the seal in sealed engagement therewith and has a discharge opening below the seal such that chemicals can be introduced through the conduit under pressure into the water below the seal for the chemical treatment thereof.

3,770,059
EXPLOSION & FIRE SUPPRESSION SYSTEM FOR CATALYTIC REACTORS

James J. Graham, Wayland, Mass., assignor to The Badger Company, Inc., Cambridge, Mass.

Filed Feb. 8, 1971, Ser. No. 113,297
Int. Cl. A62c *35/00*
U.S. Cl. 169—1 A **18 Claims**

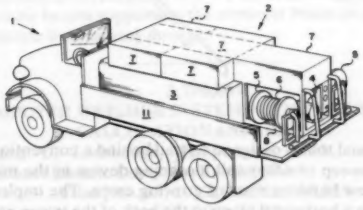


A system for detecting ignition of combustibles in catalytic reactors and appurtenant equipment and for injecting a gaseous suspension of inert finely-divided solids to the combustion site to suppress combustion.

3,770,060
MODULAR FIREFIGHTING UNIT

John P. Forsyth; Robert W. Forsyth, both of Upland; Donald R. Holcomb, Ontario, and Nathan N. Shiovitz, Anaheim, all of Calif., assignors to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Dec. 26, 1972, Ser. No. 318,594
Int. Cl. A62c *27/00*
U.S. Cl. 169—24 **4 Claims**

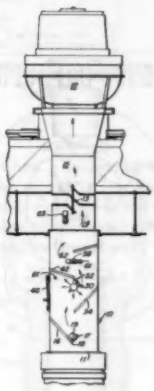


A compact firefighting unit which is a self-contained system that can be installed on an unmodified cargo truck. The equipment such as tanks, pump, hose reels and the like are mounted on a frame, which includes provisions to facilitate loading the unit on the truck and a locking mechanism for attaching the unit to the bed of the truck and requiring no modification or alteration of the truck.

3,770,061
AIR SCRUBBER APPARATUS WITH IMPROVED FIRE EXTINGUISHING MEANS

Trenton O. Hall, Miami, Fla.

Continuation-in-part of Ser. No. 92,822, Nov. 25, 1970, abandoned. This application Nov. 3, 1971, Ser. No. 195,170
Int. Cl. A62c *3/00*
U.S. Cl. 169—2 R **17 Claims**

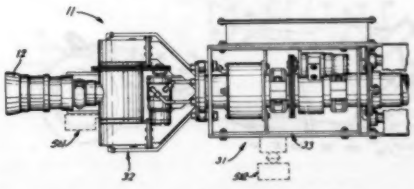


A fire extinguisher safety system for an air scrubber apparatus of the type using pressurized fire extinguishing material, comprising a housing with spray means and fire extinguisher nozzle means mounted to the housing. A chemical container is connected to the fire extinguishing nozzle means by a conduit which is adapted by diverter means to carry fire extinguishing material originating from the chemical container to the nozzle means.

3,770,062
FIRE FIGHTING APPARATUS

David K. Riggs, Newton, Iowa, assignor to American Fire Apparatus Co., Battle Creek, Mich.

Filed Oct. 12, 1970, Ser. No. 79,974
Int. Cl. A62c *27/00*
U.S. Cl. 169—24 **25 Claims**



Apparatus adapted for fire fighting including a monitor unit for supporting a nozzle for continuous rotation in one plane and for pivotal motion through a wide arc in a further plane. Remotely electrically controlled hydraulic valves control such pivoting and rotation of the nozzle as well as the output stream pattern of the nozzle. A multisection telescoping boom sup-

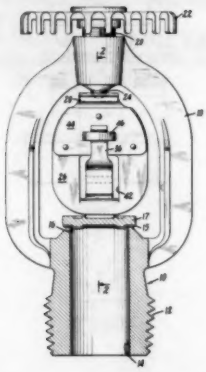
ports the monitor unit at its upper end and contains telescoping slip tubes for delivering fire fighting fluid through the monitor unit to the nozzle as well as hydraulic and electrical lines for energizing and controlling the functions of the monitor unit. The boom is supportable on a truck for continuous rotation in one plane and for pivotal movement through a wide arc in a further plane, a pivoting joint being provided for allowing water flow to the boom at the pivot axis of the boom.

3,770,063

CENTER STRUT FIRE PROTECTION SPRINKLER HEAD

Richard F. Juliano, Bronxville, N.Y., assignor to The Reliable Automatic Sprinkler Company Inc., Mount Vernon, N.Y.

Filed Jan. 31, 1972, Ser. No. 221,980
Int. Cl. A62c *37/12*
U.S. Cl. 169—39 **11 Claims**



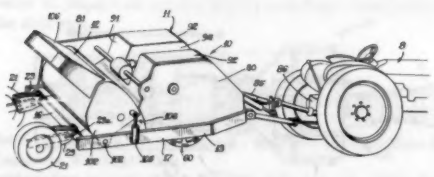
A fire protection sprinkler head having a center strut holding a valve cap closed has a pair of levers in series, fulcrumed on the center strut such that the tensile force acting on a fusible soldered joint is minimized.

3,770,064

ROW CROP PULLER-SHREDDER

Thomas J. Scarnato, Barrington; James J. Dryan, Chicago; James J. Nicholson, Lockport; Craig M. Lawler, Downers Grove, and Anthony J. Falanga, Lemont, all of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed June 6, 1969, Ser. No. 830,966
Int. Cl. F01d *25/04*
U.S. Cl. 171—58 **13 Claims**



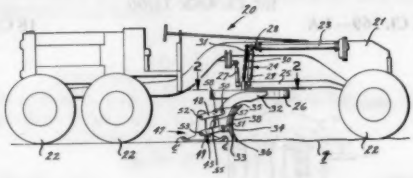
An agricultural implement effective to remove from the soil implanted crop residue and the like, while at the same time preparing a seed bed for optional concomitant planting operations, the implement having puller wheels that work the soil and converge and grasp the residue below the surface of the soil in uproot the same and feed it into a shredder positioned in receiving relation thereto, the shredder being operative to comminute the residue and having means to selectively collect or distribute it about the field; and a planting assemblage selectively attachable in trailing relation to the shredder and having an orientation with respect to the puller wheels to simultaneously plant a crop in the seed bed prepared by the wheels.

3,770,065

SKID SUPPORTED CUTTING BLADE

Raymond E. Gill, and Floyd J. McMahon, both of Peoria, Ill., assignors to Westinghouse Air Brake Company, Pittsburgh, Pa.

Filed Aug. 11, 1971, Ser. No. 170,730
Int. Cl. E02f *3/76, 3/12*
U.S. Cl. 172—4.5 **11 Claims**



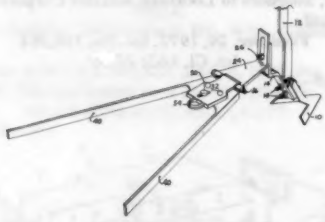
A surface finishing vehicle having a skid supported cutting blade, the height of which is automatically controlled by a position sensing apparatus disposed in engagement with a reference string preset at a predetermined grade; the skid being connected to the cutting blade through a parallel linkage assembly and a double-acting cylinder which latter is in circuit with the position sensing apparatus whereby extension and retraction of said cylinder is effected responsive to the movement of said apparatus along said reference string.

3,770,066

TILLAGE IMPLEMENT

Arthur W. Young, 3305-45th Street, Lubbock, Tex.

Filed Nov. 18, 1971, Ser. No. 200,116
Int. Cl. A01b *5/00*
U.S. Cl. 172—194 **3 Claims**



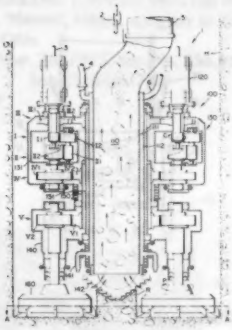
A special tool is designed to trail behind a conventional cultivator sweep or other soil loosening device in the middle of the furrow between rows of growing crops. The implement is hinged in a horizontal plane to the back of the sweep and is adjustable as to height and width. The implement clears the furrow of loose soil between the rows of the growing crops and shapes the furrow and pushes the dirt to the row to cover small weeds.

3,770,067

REACTION COUNTERBALANCED EARTH BORING

Nobuhisa Ikeda, Kanagawa, Japan, assignor to Tone Boring Company Limited, Tokyo, Japan

Filed Oct. 26, 1971, Ser. No. 192,153
Claims priority, application Japan, May 13, 1971, 46/32015
Int. Cl. E21b *3/08, 9/28*
U.S. Cl. 175—95 5 Claims



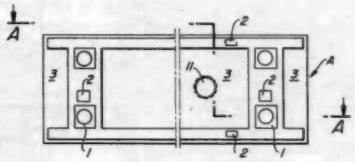
Earth boring using a machine having a plurality of cutters which are disposed at mechanically balanced positions on a casing co-axial with and rotatable about the center axis of the machine, the output of a motor being divided into two, one output being used to rotate the cutters about their own axes in one direction, the other being used to rotate the casing in the opposite direction, the total torque for rotating the cutters being substantially equal to the torque for rotating the casing whereby the reaction moment required for supporting the machine is negligible.

3,770,068

CONCRETE WEIGH BRIDGE

Nils Goran Ahl, Vasteras, Sweden, assignor to Transcale AB, Vasteras, Sweden

Filed Sept. 13, 1972, Ser. No. 288,747
Claims priority, application Sweden, Sept. 14, 1971, 11662/71
Int. Cl. G01g *19/02*
U.S. Cl. 177—134 11 Claims



A weigh device having a platform comprised of a prestressed concrete beam of T—T cross sectional design with two cross beams supporting the concrete beam on a plurality of discrete load sensing devices.

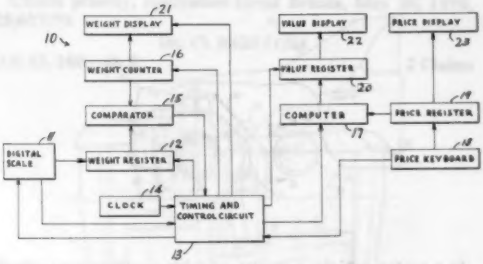
3,770,069

COMPUTER WEIGHER SYSTEM WITH INTERMEDIATE CALCULATION AND DISPLAY

Richard C. Loshbough, Temperance, Mich., assignor to Reliance Electric Company, Toledo, Ohio

Filed Nov. 28, 1972, Ser. No. 310,029
Int. Cl. G01g *23/22*
U.S. Cl. 177—1 16 Claims

An improved control for an electronic computing scale which computes, for example, the value of an article based upon a predetermined price per unit weight for the article. The weight of the article is multiplied times the predetermined price to obtain the article value which is displayed on a visual readout device. The weight used in computing the value is stored in a memory. The weight of the article is periodically measured and compared with the stored weight. A new value



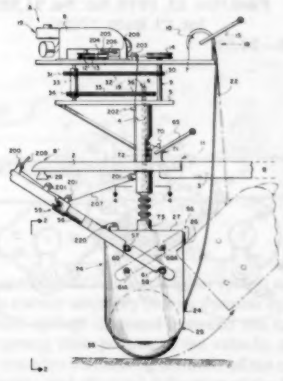
is computed only when a measured weight differs from the weight stored in the memory. The memory is cleared if the predetermined price is changed or the article is removed from the scale. In addition to the value, the predetermined price and the weight stored in the memory are displayed on visual readout devices.

3,770,070

UTILITY VEHICLE

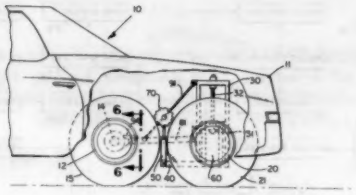
Jimmie D. Smith, 417 Hanover St., Irving, Tex.

Filed July 29, 1971, Ser. No. 167,349
Int. Cl. B62d *53/04*
U.S. Cl. 180—13 12 Claims



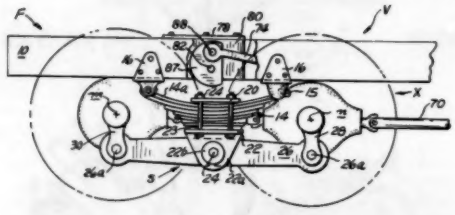
A utility vehicle and vehicle mover that is power propelled, and may be moved by an individual to both lift and transport extremely heavy vehicles, such as trailers, when the vehicle has been disconnected from its prime mover. In one embodiment, the mover includes an adjustable power lifting means that may extend a distance under the trailer tongue for increased stability. In another embodiment, the mover mechanism is integral with the trailer tongue itself.

3,770,071
TRACTION DEVICE FOR MOTOR VEHICLE
George E. Opel, 4031 Kottler Dr., Lafayette Hill, Pa.
Filed Jan. 24, 1972, Ser. No. 220,348
Int. Cl. B60b 15/00
U.S. Cl. 180—15 2 Claims



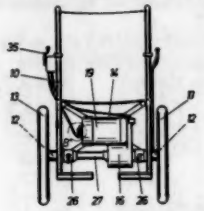
In a motor vehicle, a freely rotatable auxiliary rear wheel equipped with an anti-skid tire is supported by an elevator mechanism in raised position behind each rear drive wheel. When driving conditions are hazardous, as in snow or on icy roads, the auxiliary wheels are lowered into surface contact with the roadway in alignment with the tracks of the normal rear drive wheels. In lowering the auxiliary wheels into road contact, the elevator mechanisms actuate lever linkages which apply a jacking force upwardly on the normal rear drive-axle housings. In their lowered road-contact positions, the auxiliary wheels are driven and braked by the rear drive wheels through spiked idler wheels which are pulled into spring-loaded contact with the tread surfaces of the tires of the rear drive wheels and also the auxiliary wheels. Spring-loaded pistons maintain the idler wheels tightly against the tires of the rear drive wheels and auxiliary wheels.

3,770,072
TRACTION INCREASING APPARATUS
Jack E. Cheney, 808 E. Gaylord St., Mount Pleasant, Mich.
Filed Nov. 23, 1970, Ser. No. 91,855
Int. Cl. B60k 17/36
U.S. Cl. 180—24.09 20 Claims



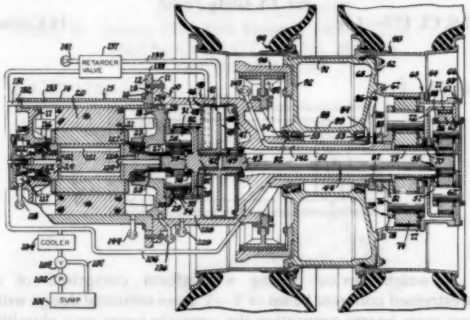
Traction increasing apparatus for a surface vehicle supported on front and rear rotatable road wheels having no traction, which are connected to a source of driving power for propelling the vehicle. The rotational velocity of the front road wheels is alternately increased and decreased while the rotational velocity of the rear road wheels is simultaneously respectively decreased and increased to alternately decrease and increase the traction of the front road wheels while respectively increasing and decreasing the traction of the rear road wheels.

3,770,073
FOLDABLE INVALID CHAIR
Wilhelm Meyer, 3 Kleinbahnhofstrasse, 4973 Vlotho, Germany
Continuation-in-part of Ser. No. 862,210, Sept. 30, 1969, abandoned. This application Mar. 30, 1971, Ser. No. 129,424
Claims priority, application Austria, Oct. 1, 1968, 9558
Int. Cl. B60k 1/00
U.S. Cl. 180—65 R 5 Claims



A foldable invalid chair, comprising two hingedly connected side frames provided with bearings for the mounting of axles of driving wheels and dirigible wheels, the driving wheels being in the form of running wheels mounted on the side frames. A detachable propulsion unit, including an electric motor is positioned between the side frames, and is coupled to the axles of both driving wheels.

3,770,074
REDUCTION DRIVE FOR ELECTRIC AXLE
Warren S. Sherman, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.
Filed Apr. 24, 1972, Ser. No. 246,694
Int. Cl. B60k 7/00
U.S. Cl. 180—65 F 12 Claims



A drive axle assembly having a tubular support housing adapted to be mounted on a vehicle frame and rotatably supporting a driving wheel. A high speed electric motor mounted on the inboard end of the support housing driving an inboard reduction gearset which is connected by an intermediate shaft rotating at an intermediate speed to drive an outboard reduction gearset at the outboard end of the support housing. A hydrodynamic brake rotor rotates with the intermediate shaft between stator blades fixed to the support housing. The outer end of the support housing is closed by a rotary housing at-

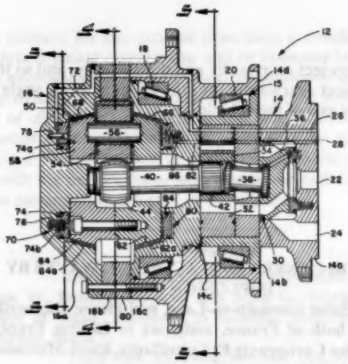
tached to the wheel. A common hydraulic system provides a single fluid for the motor cooling circuit, hydrodynamic retarder and gear lubrication.

3,770,075

FREE WHEELING 2-SPEED MOTOR WHEEL

Edgar Z. Vegners, Mound, Minn., assignor to Eaton Corporation, Cleveland, Ohio

Filed Mar. 20, 1972, Ser. No. 236,416
Int. Cl. B60k 7/00
U.S. Cl. 180—66 F 11 Claims



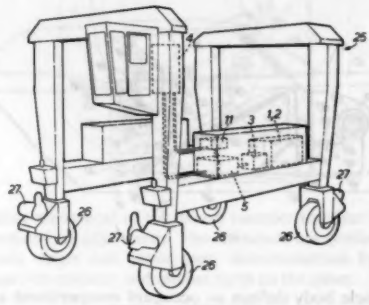
A motor wheel for use in a ground engaging drive wheel of a vehicle includes a hydraulic motor disposed in a housing, the output shaft of the motor is connectable through a complex planetary gearing and clutch arrangement to drive a casing which is rotatably mounted relative to the housing. The driving force from the output shaft of the hydraulic motor is transmitted to a planetary gear set by means of an arcuately configured sun gear formed on one end of the drive shaft, the planetary gears are disposed about the sun gear to transmit the driving force to a ring gear mounted in the casing. A planetary carrier is disposed in the casing for supporting the planetary gears during relative rotative movement about the sun gear. The planetary carrier is normally disposed in an initial neutral position for free rotative motion relative to both the casing and the housing to thereby provide free wheeling of the motor wheel. The planetary carrier is axially slidable relative to the sun gear and ring gears in either direction from the neutral position to thereby provide a high speed and a low speed gear ratios. Driving engagement between the carrier and the housing is established upon movement of the carrier in one direction from the neutral position and driving engagement between the carrier and the casing is established upon movement of the carrier axially in the other direction from the neutral position. Springs are provided to maintain the carrier normally centered and out of engagement with either the casing or the housing to provide the free wheeling condition of said wheel motor. Hydraulically actuated annularly shaped clutch pistons are disposed in recesses in the casing and housing respectively and are operable upon the application of fluid pressure thereto to move the carrier into driving engagement with either the housing or the casing to thereby provide a hydraulically operated motor wheel having both direct and low speed driving ratios as well as free wheeling. Valve means are provided to part pressurized hydraulic fluid for actuating the pistons and to simultaneously reverse fluid flow through the hydraulic motor upon actuation thereof to provide the required direction of rotation of the hydraulic motor.

3,770,076

HYDRAULIC SYSTEMS

Peter Thomas Ward, Lichfield; Richard Terence Smith, Trysull, and Donald Siverns, Sedgley, all of England, assignors to Rubery, Owen & Co. Limited, Wednesbury, England

Filed May 27, 1971, Ser. No. 147,594
Claims priority, application Great Britain, May 28, 1970, 25,657/70
Int. Cl. B62d 11/04
U.S. Cl. 180—66 R 2 Claims



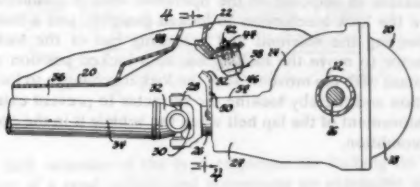
In an hydraulic system a pump draws liquid from a header tank by way of an auxiliary tank which is connected to the header tank, and the discharge from the pump is fed to either tank or partly to each tank under the control of a diverter valve in order to maintain the temperature of the working liquid within desired limits.

3,770,077

VEHICLE SUSPENSION SYSTEM

William S. Johnson, Madison Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed July 21, 1972, Ser. No. 274,074
Int. Cl. B60g 7/04
U.S. Cl. 180—71 3 Claims



An improved automobile rear suspension system of the type including an axle carrier assembly having a pinion carrier portion, a pair of coil springs disposed between the carrier assembly and the sprung mass portion of the vehicle, and a plurality of control arms for controlling the orbit of the carrier assembly during jounce and rebound deflection of the latter, the improvement residing in the provision of a cushion bumper assembly disposed on the sprung mass portion and including a pair of bumper members, and a pair of abutments on the pinion carrier portion. Each of the abutments is engageable exclusively on a corresponding one of the bumper members to limit jounce deflection, one of the bumper members being operative only when the axle assembly experiences jounce deflection in a "wind-up" configuration and other bumper members being operative at all other times so that all available clearance space is utilized for maximizing permissible jounce deflection.

3,770,078

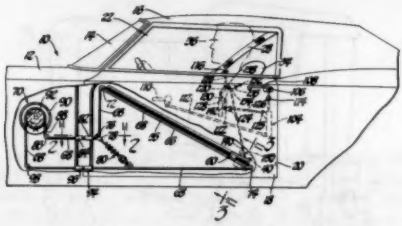
DOOR LOCK ASSEMBLY AND DOOR RETRACTOR INTERLOCK

Charles M. Keppel, Holly, and Irwin K. Weiss, Birmingham, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed June 25, 1971, Ser. No. 156,808

Int. Cl. B60r *21/10*

U.S. Cl. 180—111 **3 Claims**



A vehicle body defines an occupant compartment and includes a seat mounted within the compartment and accessible through a side door opening selectively opened and closed by a side door, a belt arrangement with lap and shoulder belts whose first ends are secured adjacent an inboard portion of the seat and whose second ends are respectively received by a door mounted locking retractor and a vehicle body mounted inertia retractor, door and roof rail mounted carriers slidably receiving respective intermediate portions of the lap and shoulder belts, drive mechanisms for moving the carriers between forward and rearward positions in response to an operative condition of the vehicle to move the belts between easy-enter and occupant restraining positions, a door lock assembly mounted on the rear edge of the door and having a latch mechanism movable to a latched position to maintain the door in closed position and a lock mechanism movable to a locked position to prevent movement of the latch mechanism from latched position to unlatched position, a solenoid connected to the lock mechanism by a linkage and actuatable in response to the operative vehicle condition to move the lock mechanism to locked position, and a linkage connecting the solenoid and a locking bar of the locking retractor to move the locking bar to a locked position concomitant with the movement of the lock mechanism to locked position and thereby locking the retractor to prevent extending movement of the lap belt when the vehicle is in the operative condition.

3,770,079

FLEXIBLE SKIRT ASSEMBLIES FOR AIR CUSHION VEHICLES

Raymond Leslie Wheeler, East Cowes, and John Henry, Cowes, both of England, assignors to British Hovercraft Corporation Limited, Yeovil, Somerset, England

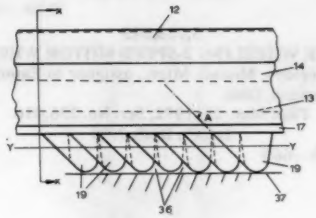
Filed Feb. 9, 1972, Ser. No. 224,760

Claims priority, application Great Britain, Feb. 16, 1971, 4,761/71

Int. Cl. B60v *1/16*

U.S. Cl. 180—127 **6 Claims**

An air cushion vehicle has a flexible skirt assembly which includes a plurality of independent flexible segments. Each segment has an outer part which is arcuate in plan view with the concave surface thereof positioned for facing the cushion and two webs projecting one from each side of the arcuate part into the cushion. Those segments which are positioned beneath the longitudinal sides of the vehicle are formed and



fitted so as to project rearwardly and downwardly, and so that their webs project rearwardly into the cushion at an angle to the longitudinal axis of the vehicle.

3,770,080

DEVICE FOR GENERATING ACOUSTIC WAVES BY IMPLOSION

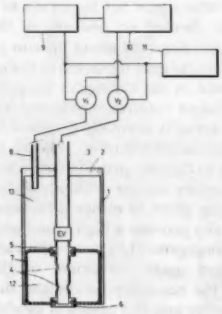
Jean Laurent, Saint Germain-en-Laye, and Pierre Magneville, Vernouillet, both of France, assignors to Institut Francais Du Petrole Des Carburants Et Lubrifiants, Rueil-Malmaison (Hauts-de-Seine), France

Filed Sept. 20, 1971, Ser. No. 182,040

Claims priority, application France, Sept. 24, 1970, 7034726

Int. Cl. G01v *1/02*

U.S. Cl. 181—.5 H **12 Claims**



Device for generating pressure waves in a liquid medium comprising a hollow cylinder closed at one end by a bottom and at the other hand by an inflatable membrane pressing against the inner cylinder wall in the position of closure of the cylinder and capable to collapse abruptly when deflated, thereby giving passage to the liquid medium. For operating the device a substantial vacuum is created in the cylinder when closed by the membrane in inflated position and, by controlling the gas pressure in the enclosure formed by the membrane, the latter is allowed to collapse abruptly, so that the subsequent abrupt rush of liquid in the cylinder generates sound waves.

3,770,081

SILENCER FOR COMBUSTION ENGINES

Gene L. Martin, Anaheim, Calif., assignor to M-Line, Inc., Anaheim, Calif.

Continuation of Ser. No. 104,078, Jan. 5, 1971, abandoned.
This application Oct. 13, 1972, Ser. No. 299,957
Int. Cl. F01n 3/06
U.S. Cl. 181—36 B 6 Claims

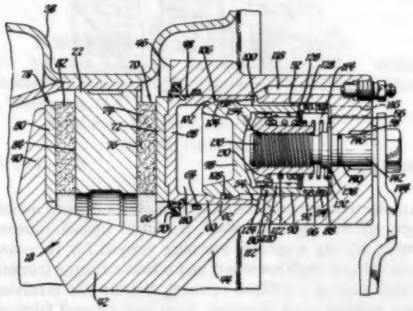
A silencer for the exhaust pipe from a combustion engine wherein a jacket attached to and of diameter larger than the pipe encloses a perforated sleeve of relatively smaller diameter providing a space therebetween. A tube inside the sleeve and of diameter smaller than the sleeve forms an annular chamber between them. Tabs punched from the wall of the tube are bent to transverse positions within the tube and, acting with the perforations, form a tortuous path for hot exhaust gases passing from the pipe to the silencer.

3,770,082

DISC BRAKE CALIPER ASSEMBLY

Frank W. Brooks, Dayton, and John G. Sebring, Arcanum, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 29, 1972, Ser. No. 310,351
Int. Cl. F16d 65/56
U.S. Cl. 188—71.9 3 Claims



A disc brake caliper assembly having a hydraulic actuating cylinder incorporating two separate hydraulic chambers, a manually acutated parking brake mechanism, and a brake adjuster.

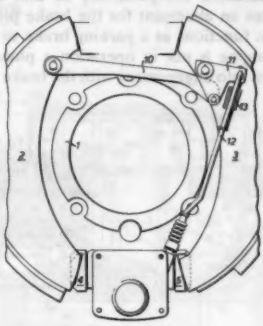
3,770,083

AUTOMATIC ADJUSTERS

Charles Newstead, and Andrew Charles Walden Wright, both of Kings Rd., Tyseley, Birmingham, England

Filed Mar. 30, 1972, Ser. No. 239,561
Claims priority, application Great Britain, Mar. 30, 1971, 8,170/71
Int. Cl. F16d 65/56
U.S. Cl. 188—79.5 GC 9 Claims

An auto-adjuster assembly for an internal shoe drum brake comprises a uni-directional drive device the driving member of which is spring biassed in one direction and connected to a shoe movement sensor in such a manner that expansion of the shoe allows the spring to move the driving member, whereas return movement of the shoes drives the member to effect corresponding movement of the driven member to effect in turn an increment of adjustment. The members are preferably a concentric drum and inner part, interconnected by pawl means on one member and ratchet teeth on the other.

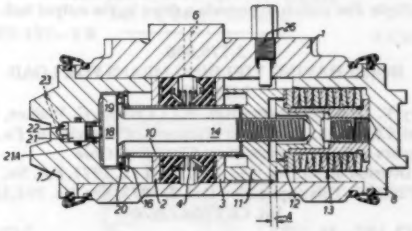


3,770,084

VEHICLE BRAKE ACTUATOR AND LOCK ASSEMBLY

Albert Charles Hill, Tyseley, Birmingham, England, assignor to Girling Limited, Birmingham, England

Filed June 2, 1971, Ser. No. 149,197
Claims priority, application Great Britain, June 2, 1970, 26,531/70
Int. Cl. F16d 63/00
U.S. Cl. 188—265 5 Claims



A lock actuator of the type employed for locking on the brakes of a road vehicle and comprising an extensible strut and a clutch for locking the strut in extending condition is characterized by the fact that the clutch has substantial clearance built into it and the usual clutch spring is omitted, so that some relaxation (shortening) of the clutch is permitted before the strut finally locks. The lock actuator may form an independent unit or be built into a slave cylinder of a wheel brake.

3,770,085

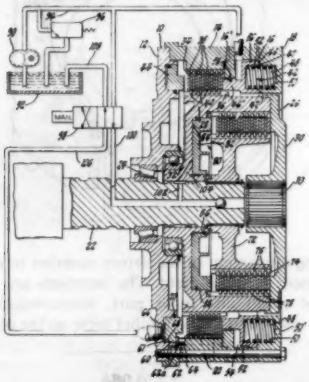
VEHICLE CLUTCH AND BRAKE

Edgar R. Cottingham, Hudson, Ohio, assignor to General Motor Corporation, Detroit, Mich.

Filed Jan. 28, 1972, Ser. No. 221,751
Int. Cl. F16d 67/04
U.S. Cl. 192—13 R 4 Claims

A vehicle brake having a stationary housing, an output hub rotatably mounted on the housing and a multiple plate disc brake operatively connected between the housing and the out-

put. The brake plates are spaced such that alternate members are splined to the housing and the output hub. The brake plates are engaged to prevent rotation of the output hub by a pair of pistons one of which is spring applied and pressure released and the other of which is pressure applied. The pistons are actuated independently so that the unactuated piston provides an abutment for the brake plate. The spring applied piston functions as a parking brake so that whenever the vehicle engine is not in operation a plurality of springs urge the piston into engagement with the brake plates to effec-



tively connect the output hub to the stationary housing thereby preventing rotation of the output hub. When the engine is operating, fluid pressure is supplied to the piston to compress the springs thereby disengaging the brake. The fluid pressure to operate the other piston is controlled by a valve to permit selective operation of the brake during vehicle driving to permit the operator to stop or retard the vehicle or in a track laying type vehicle to permit the operator to have steer control. An input shaft is also rotatably mounted in the housing and is selectively connectable with the output hub through a multiple disc clutch to provide a drive to the output hub.

3,770,086

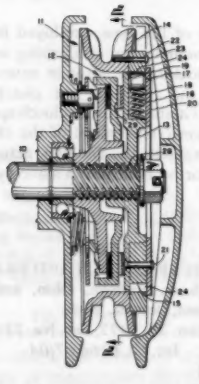
HOIST HAVING YIELDING MEANS FOR LOAD LIMITING

Harry Y. Jackson, Cherry Hill, N.J.; Charles C. Walker, Forrest City, Ark., and John Ramoska, Philadelphia, Pa., assignors to Eaton Corporation, Cleveland, Ohio

Division of Ser. No. 133,098, April 12, 1971, Pat. No. 3,720,077. This application Oct. 2, 1972, Ser. No. 294,150

Int. Cl. F16d *13/76*

U.S. Cl. 192—16 **2 Claims**



A hand operated hoist has a hand wheel that is formed in parts operatively connected through spring pressed roller detents engaging detent recesses of asymmetrical shape for applying load lifting torque to the hoist. The recesses have long inclined surfaces on which the detents will ride after an overload amount of lifting torque causes the detents to leave seated position in the recesses. Thereby the detents will yield gradually while in effect releasing the load lifting effort that an operator applies to the hand wheel, but offering resistance to the operator's effort so as to reduce the hazard that would be incidental to a sudden release. The asymmetrical shape of each recess includes a steep surface that will hold a detent in the recess so as to permit an application of the amount of force necessary to release a load brake when a load is to be lowered.

3,770,087

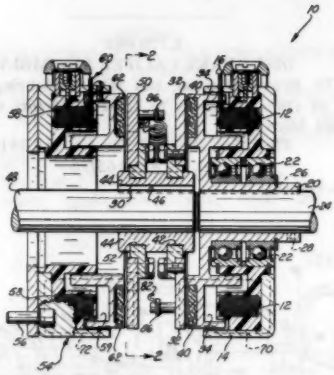
SPLINE CLEARANCE REDUCTION FOR COUPLINGS

Ralph L. Jaeschke, Kenosha, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed May 12, 1972, Ser. No. 252,889

Int. Cl. F16d *67/06*

U.S. Cl. 192—18 B **4 Claims**

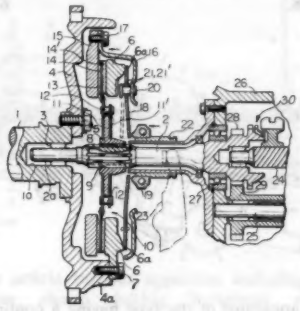


An electromagnetic coupling includes a driving member, a driven splined shaft member, a clutch torque transmitting member having a splined opening therein for receiving the driven splined shaft member, and a brake torque transmitting member having a splined opening therein for receiving the driven splined shaft member. First and second friction surfaces are provided for engagement with the clutch torque transmitting member and the brake torque transmitting member respectively. When the clutch torque transmitting member engages with the first friction surface the driving member will drive the driven member and when the brake torque transmitting member engages with the second friction surface the driven member will be braked. Spring means is provided connected to the clutch and brake torque transmitting members for exerting a torque moment on the clutch torque transmitting member in one direction about the driven splined shaft and on the brake torque transmitting member in an opposite direction about the driven splined shaft. The spring means acts to preload the clutch and brake torque transmitting members to prevent excessive spline clearance between the splined openings in the brake and clutch torque transmitting members and the splined shaft. The elimination of excessive spline clearance by the spring means decreases spline wear as excessive spline clearance results in brinelling and premature failure of the coupling.

3,770,088
FRICTION-ENGAGING DEVICE

Kinji Shono, Wakoh, Japan, assignor to Nissan Motor Co., Ltd., Kanagawa-ku, Yokohama, Japan

Filed Dec. 16, 1971, Ser. No. 208,561
Claims priority, application Japan, Dec. 22, 1970, 45/129341
Int. Cl. F16d *13/44*
U.S. Cl. 192—70.27 4 Claims

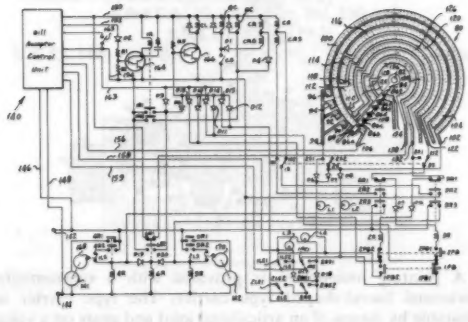


Herein disclosed is a friction-engaging device such as a friction clutch for motor vehicle power transmission systems, having a flywheel which is made up of main and subsidiary driving plates which are rotatable together, a pressure plate axially movable between the main and subsidiary driving plates through cooperation of spring and clutch release means, and a friction-engaging plate engageable on their opposite faces with the pressure plate and the subsidiary driving plate and secured to a clutch hub which is axially slidable on a transmission input shaft. The friction-engaging plate can be disengaged from the subsidiary driving plate completely and immediately when the clutch release means is so actuated.

3,770,089
LOTTERY TICKET MERCHANDISER

Lee V. Verduin, Grand Rapids, Mich., and William Rosenhagen, Ossining, N.Y., assignors to Rowe International Inc., Whippany, N.J.

Filed Feb. 16, 1972, Ser. No. 226,667
Int. Cl. G07f *5/16*
U.S. Cl. 194—1 N 17 Claims

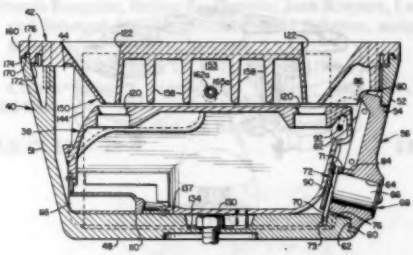


A lottery ticket merchandiser of tickets selling at two prices one of which is an integral multiple of the other, in which means responsive both to the deposit of coins and to the deposit of dollar bills establishes a credit aggregating the sum deposited to permit subsequent multiple and alternative selection of lower and higher-priced tickets until the credit is exhausted.

3,770,090
PARKING METER ASSEMBLY

Clarence D. Fayling, Pittsburgh, Pa.; John W. Van Horn, Russellville, and Philip M. Ray, Dardanelle, both of Ark.

Filed July 10, 1972, Ser. No. 270,261
Int. Cl. G07f *9/06*
U.S. Cl. 194—1 B 21 Claims

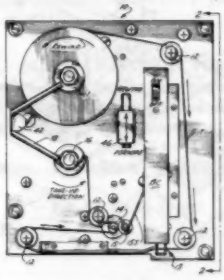


A twin parking meter mount comprising a coin vault mounting two or more parking meter heads, a coin receptacle received in the vault and serving both meter heads, a side access opening formed in the vault to provide for the removal and insertion of the coin receptacle, and a door secured to the coin receptacle and hingelessly and detachably mounted on the vault for selectively closing the access opening. Other features include an internal reinforcing liner arrangement for the coin vault and a coin vault top plate that reinforces walls of the vault.

3,770,091
WIRE TYPE TAPE PRINTING APPARATUS

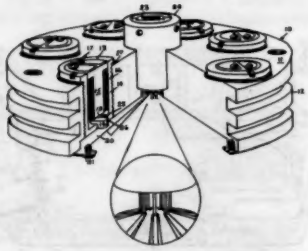
John D. Platt, Claremont, Calif., assignor to MSI Data Corporation, Montclair, Calif.

Filed Jan. 6, 1971, Ser. No. 104,352
Int. Cl. B41j *3/10, 9/00*
U.S. Cl. 197—1 R 6 Claims



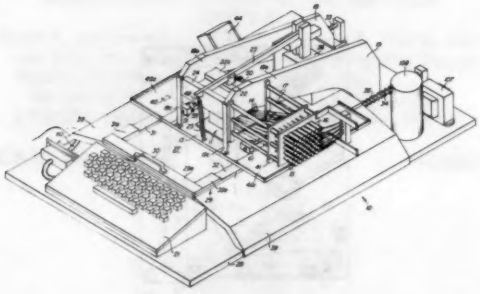
A portable strip printer for use in data collecting systems which is portable and requires small amounts of power, and may be operated from a battery. The printer includes a printing head having a plurality of independently actuated impacting elements spaced from an anvil and receiving the paper therebetween. The paper may be of the carbonless variety and is impacted "on the fly". The drive means for the printer is adapted to control the transfer of paper from one reel to another reel for printing purposes as well as controlling the transfer of tape in a "rewind" direction to allow any printed information on the paper strip to be searched and to retransfer the tape in the reverse direction to place a "clean" strip in position for printing out further information.

3,770,092
WIRE PRINT HEAD
Robert E. Grim, Joplin, Mo., assignor to Autotronics, Incorporated, Joplin, Mo.
Filed Feb. 14, 1972, Ser. No. 225,714
Int. Cl. B41j 3/10
U.S. Cl. 197—1 R 2 Claims



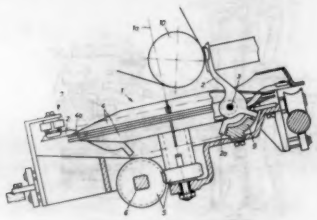
A wire printing head comprising a plurality of solenoids mounted within a frame and a plurality of spring lever arms cantilevered to the frame and having attached to the free end of the arms print wires. The print wire is moved in the direction of the medium to be printed by the movement of the solenoid armature by magnetic force in the direction of the free end of the print wire. The print wire is returned to a ready position by the spring action of the lever arm.

3,770,093
STENCIL-CUTTING APPARATUS
Guy K. De Hart, Salt Lake City; Louis K. De Hart, Provo, and Ruel R. Clark, Salt Lake City, all of Utah, assignors to Marking Systems, Inc., Salt Lake City, Utah
Filed May 14, 1971, Ser. No. 143,579
Int. Cl. B41j 3/50
U.S. Cl. 197—1.5 8 Claims



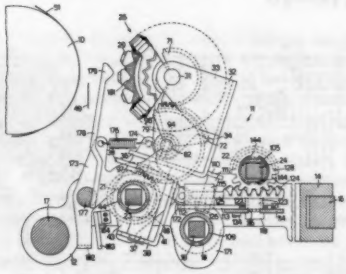
An apparatus for cutting characters, including letters, numerals, symbols and the like, into suitable substrates, such as stencil paper, cards or tapes, has a plurality of punch pins moveable within a housing between cutting and retracted positions. Corresponding, moveable selector pins are mounted in the housing to control the motion of the punch pins. Appropriate selector pins are actuated to hold selected punch pins which form the desired character in extended cutting positions relative to the housing, and the selected punch pins are actuated to cut the desired character into a substrate. Alternative embodiments employ automated input means for selecting the characters and means for holding the substrate in position and uniformly spacing individual characters and character lines with respect to the substrate.

3,770,094
PRINTING APPARATUS UTILIZING MAGNETIC SELECTION OF TYPE LEVERS FROM A CONTINUOUSLY ROTATING MAGAZINE
Folker Galaske, Pforzheim, Germany, assignor to International-Standard Electric Corporation, New York, N.Y.
Claims priority, application Germany, July 4, 1968, P 17 61 764.0
Filed May 27, 1969, Ser. No. 828,176
Int. Cl. B41j 23/38
U.S. Cl. 197—18 6 Claims



In a printing apparatus of the type having a continuously rotating type lever magazine, an arrangement is provided for effecting the contactless magnetic selection of individual type levers. Selection is accomplished by deflecting at a predetermined time the desired type lever out of its normal path of rotation into the printing track by means of an electromagnet positioned above the magazine. The pole surfaces of the electromagnet are inclined in the direction of rotation so as to impart to the selected type lever an inclined trajectory which, as a result of the continued rotation of the type lever assembly, carries the lever via free flight into the printing track.

3,770,095
PRINTING MECHANISM HAVING A SINGLE PRINTING ELEMENT
Gian Paolo Guerrini (Torino), and Remo Falconieri, Canavese, both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Torino, Italy
Filed Jan. 28, 1971, Ser. No. 110,708
Claims priority, application Italy, Feb. 2, 1970, 67307 A/70
Int. Cl. B41j 23/04
U.S. Cl. 197—18 17 Claims



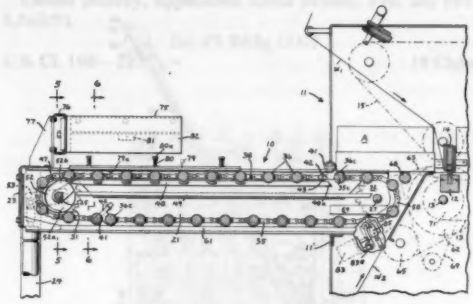
A printing mechanism is provided with a substantially horizontal barrel-shaped type carrier. The type carrier is rotatable by means of an articulated joint and gears on a yoke for selecting a row of characters. The yoke is rotatable on a bail by means of a pin and slot of a slider, for selecting a line of characters. The bail is moreover horizontally swingable on a carriage by a spring controlled by the line of characters, for printing the selected character. The carriage is transversely movable with respect to the platen and carries rotatably two hollow shafts driven by a pair of prismatic shafts parallel to the platen and selectively rotatable on the machine frame.

3,770,096

ARTICLE TRANSFER APPARATUS

Roger H. Stohlquist, Rockford, Ill., assignor to Anderson Bros. Mfg. Co., Rockford, Ill.

Filed Mar. 20, 1972, Ser. No. 236,087
Int. Cl. B65g 47/00
U.S. Cl. 198—21 8 Claims



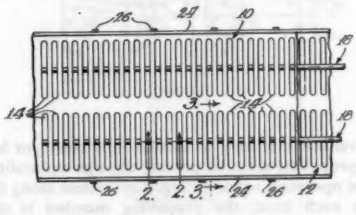
An article transfer apparatus including laterally spaced endless chains having horizontal rollers extending therebetween to provide a travelling roller bed for supporting articles on its upper run. The upper run of the roller bed is adapted to advance beneath an article without concomitant advance of the article, and one or more article pusher members are mounted on the chains intermediate adjacent ones of the rollers for vertical swinging movement relative to the chains and roller bed into and out of an operative article engaging position. Upper and lower tracks are provided along the upper run of the roller bed and a selectively operable mechanism is provided for guiding the article pusher members onto either the upper track to guidably support the article pusher members in an operative article engaging position, or onto the lower track to guide the article pusher members in a lower or inoperative position during advance along the upper run of the roller bed. The article transfer mechanism is adapted for use with a crosswise extending article supply conveyor to automatically advance articles from the supply conveyor in spaced succession and in timed relation with a subsequent article processing machine.

3,770,097

VIBRATORY CONVEYOR WITH SOUND DEADENING MEANS

Albert Musschoot, Barrington, Ill., assignor to General Kinematics Corporation, Barrington, Ill.

Filed Feb. 29, 1972, Ser. No. 230,312
Int. Cl. B65g 27/00
U.S. Cl. 198—220 BA 4 Claims



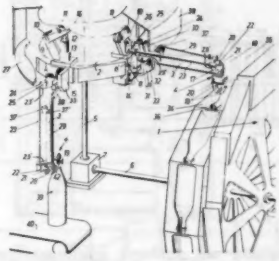
A vibratory conveyor for conveying castings from one point to another while shaking loose adhered sand therefrom. The conveyor includes a grate-like conveying surface formed of metal to support heavy castings of the like as well as to be resistant to the heat of still hot castings. A vibratory mechanism is associated with the metal grate for vibrating the same in such a way as to convey the castings. In order to preclude the steel grate from "ringing" as it repetitively contacts the castings during operation, an elongated tube is secured to the underside of the grate. The tube is filled with lead shot and serves to dampen the vibration of the grate in the audible range.

3,770,098

APPARATUS FOR REMOVING BODIES FROM A MOLDING MACHINE AND TRANSPORTING THE BODIES

Francis Baugnies, Braine-Le-Compte; Jean Bruyere, La Hulpe, and Edmond Michel, Brussels, all of Belgium, assignors to Solvay & Cie, Brussels, Belgium

Filed Sept. 17, 1971, Ser. No. 181,520
Claims priority, application France, Sept. 25, 1970, 7034946
Int. Cl. B65g 47/00
U.S. Cl. 198—25 13 Claims



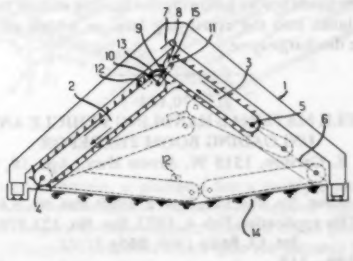
Apparatus for removing hollow plastic bodies from a blow molding machine, in which an ejector mechanism is provided to eject the finished bodies, and then placing the bodies on a conveyor. A series of gripping elements are arranged on a movable support for movement along a transport path going past a withdrawal point where each gripping element is in a proper position to remove a body from the machine and thence past a release point where each gripping element is in a proper position to deposit the body on the conveyor. Control means are provided to cause each gripping element, as it moves past the withdrawal point, to grip a body when it is ejected from the machine and extract it from the machine and, as each gripping element moves past the release point to release the body and place it on the conveyor.

3,770,099

SCRAPER-EXTRACTOR

Bernard Bernicot, 4, rue d'Anvers, Mulhouse, France

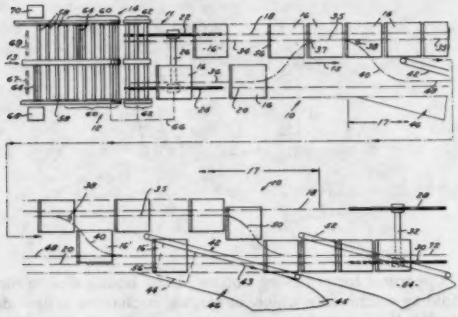
No Drawing. Continuation-in-part of Ser. No. 859,473, Sept. 19, 1969, abandoned. This application Nov. 30, 1971, Ser. No. 203,259
Claims priority, application France, June 20, 1969, 6920772
Int. Cl. B65g 59/00
U.S. Cl. 198—36 3 Claims



This gantry-type scraper-extractor comprises a gantry from which two arms equipped with endless chains carrying scraper

tools are suspended in separate planes by having their lower ends pivoted to and guided by the base of said gantry, the upper ends of said scraper arms being interconnected by a link-forming member pivoted to said upper ends and responsive to a control device of the screw-jack type determining the angular position of said member in relation to the upper end of one arm so that the upper end of the other arm constantly lies substantially above that of said first arm.

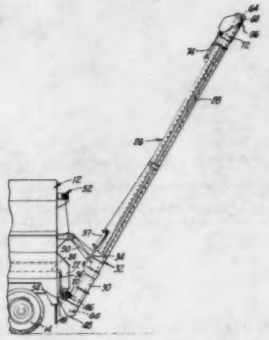
3,770,100
ARTICLE SORTING APPARATUS
Edward W. McCaul, Bloomfield Hills, Mich., assignor to Jervis B. Webb Company, Detroit, Mich.
Filed July 18, 1972, Ser. No. 272,987
Int. Cl. B65g *43/08*
U.S. Cl. 198—38 **19 Claims**



Article sorting apparatus having a plurality of recirculating carriers on which articles are placed at a loading station and are forwarded to a selected one of several discharge stations arranged along a discharge zone. Each carrier is supported for movement transversely to the forwarding direction and has a guide member engaging a guide track which defines the transverse carrier position. Along the discharge zone, the guide tracks define a conveying lane and a discharge lane of forward movement for the carriers, the discharge lane being spaced transversely from and being connected to the conveying lane in advance of each discharge station by an independently selectable branch lane. Each discharge station is equipped with a fixed type of diverter which extends obliquely across the discharge lane in the path of article travel and above the path of carrier travel. Following the discharge zone, the guide track defines a single return lane of travel for all carriers to a junction in the guide track, in advance of the loading station, where the carriers are switched alternately to one of a pair of transversely spaced loading lanes. Induction mechanism at the loading station enables articles to be coded to a desired discharge station and advanced in timed relation with the arrival at the loading station of alternate carriers in the loading lanes. The guide tracks following the loading station merge the loading lanes into the conveying lane on which all carriers enter the discharge zone.

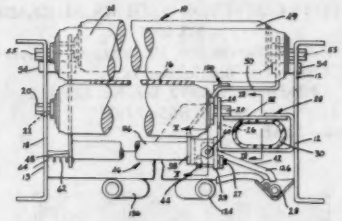
3,770,101
BULK MATERIAL HANDLING VEHICLE AND UNLOADING BOOM THEREFOR
Bernard E. Carlson, 1515 W. Arrow Hwy., Apt. 18, Upland, Calif.
Division of Ser. No. 874,101, Nov. 6, 1969, Pat. No. 3,642,155.
This application Feb. 4, 1972, Ser. No. 223,570
Int. Cl. B60p *1/00*; B65g *21/12*
U.S. Cl. 198—115 **6 Claims**

A bulk material handling vehicle having a bulk material storage body and an articulated unloading boom hinged to one end of the body for movement between a retracted travel position wherein the boom is folded against one side of the body and an erect service position wherein the hinged boom sections are aligned. The boom contains an endless conveyor for transporting bulk material upwardly through the boom to the



upper outfeed end of the boom and is equipped with means for regulating the conveyor tension and supporting the conveyor at the hinged joint of the boom in such a way as to prevent snagging of the conveyor between the hinged boom sections as the latter are rotated to their aligned positions.

3,770,102
ACCUMULATOR WITH TRANSPORT OVERRIDE
Maynard J. DeGood, Grand Rapids, Mich.
Filed July 30, 1971, Ser. No. 167,617
Int. Cl. B65g *13/071*
U.S. Cl. 198—127 R **2 Claims**



This invention discloses an accumulator conveyor having a powered propelling member passing through a plurality of independent operating zones arranged in tandem along the conveyor. In each zone, the propelling member is shiftable between an article propelling and an article non-propelling position by pneumatically actuated pressure rollers acting on the propelling member. A valve operated by an article detecting sensor in each zone operates to supply or exhaust fluid pressure to the actuators. An auxiliary valve system connected between a secondary pressure source and the actuators operates to shift all of the operating zones into an article propelling position thereby overriding the accumulator function of the conveyor.

3,770,103

TABLES

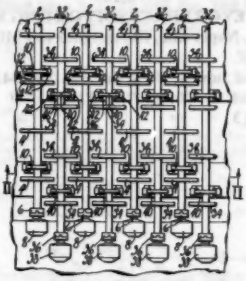
Allan Ball, Poole; Dennis Stubbs, and William James Richmond, both of Sheffield, all of England, assignors to Davy and United Engineering Company Limited, Sheffield, England

Filed Feb. 9, 1972, Ser. No. 224,852

Claims priority, application Great Britain, Feb. 26, 1971, 5,568/71

Int. Cl. B65g *13/02*

U.S. Cl. 198—127 **11 Claims**



A plate cooling bed consists of a number of parallel shafts on each of which are mounted a number of equal discs which support and transport the plate. The shafts have no axial bearings, and, instead, each shaft is supported by a number of secondary discs, which have a diameter less than that of the support discs, and which are engaged by pairs of rollers beneath the shafts. Each shaft is driven at its ends.

3,770,104

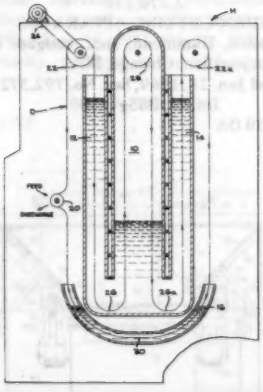
GATED CARRIER FOR HYDROSTATIC COOKER

James L. Reimers, San Jose, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Nov. 23, 1971, Ser. No. 201,394

Int. Cl. B65g *19/00*

U.S. Cl. 198—131 **8 Claims**



In a hydrostatic cooker, the carriers on the conveyor chain are in the form of pockets, mounted on one set of links which can be closed by gates mounted on adjacent links with abutments to prevent opening of the pockets in one direction of chain articulation and to accommodate opening of the pockets in the other direction of flexure for feed and discharge. Several embodiments are disclosed.

3,770,105

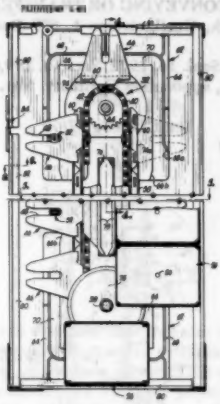
PRODUCT DISPLAYING, SELECTIVE, DISPENSING APPARATUS

Wilbert O. O'Neal, Independence, Mo., assignor to The Vendo Company, Kansas City, Mo.

Filed May 9, 1972, Ser. No. 251,744

Int. Cl. B65g *15/00*

U.S. Cl. 198—138 **16 Claims**



A general merchandising machine has product carriers which are moved in a rectangular path of travel in succession past a display window and a dispensing station for customer access to a product selected from one of the carriers and brought into registration with the station. The carriers are positively controlled against tipping along the straight stretches of their path of travel as well as during change of direction at the corners thereof, and special mountings for each carrier plus openable track sections for the carriers facilitate removal and replacement of the carriers for cleaning or maintenance.

3,770,106

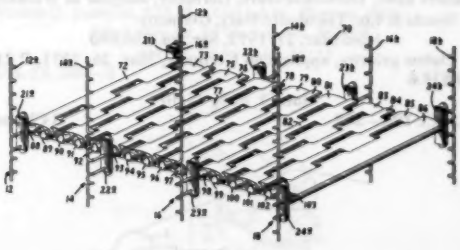
PLATFORM ASSEMBLY FOR MULTIPLE CHAIN TRANSPORT DEVICE

Guenther L. Kuehl, Peekskill, and Alfonso Depietro, Valhalla, both of N.Y., assignors to Guenther Systems, Inc., Buchanan, N.Y.

Filed June 1, 1971, Ser. No. 148,385

Int. Cl. B65g *17/06, 17/34*

U.S. Cl. 198—154 **4 Claims**



As disclosed herein, a platform for a multiple chain pair transport device includes a plurality of spaced rigid linear members coupled at their ends to selected chain pairs and a plurality of support members which span the distance between the chain pairs. Selected support members are secured to the spaced rigid linear members and supported thereby, and the support members have double-barreled configurations with

keyways formed therein. Successive support members include overlapping portions that are hinged together by pin members which permit the support members to flex upwardly in the absence of a load bearing thereagainst and to be rigidly locked in horizontal position in response to loads bearing downwardly against the support members.

3,770,107

DEVICE FOR CONVEYING OR TRANSFERRING EGGS

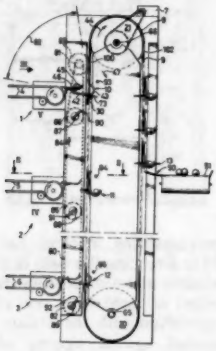
Alfons Michelbach, Goethestrasse 1, 699 Bad Mergentheim, Germany

Filed Sept. 14, 1972, Ser. No. 289,061

Claims priority, application Germany, Nov. 22, 1971, P 21 57 774.2

Int. Cl. B65g *17/00*

U.S. Cl. 198—157 **6 Claims**



An egg transferring or collecting device for collecting eggs from several superimposed channels and conveying them to a single channel comprises a main vertical endless chain conveyor with a number of baskets in the form of multi-tine forks, the baskets being pivoted so as to occupy either a "collect" position or a "deliver" position, both positions being stable. On the "up" moving side of the chain each basket is tipped to a collect position at a respective channel, and whether eggs are collected there or not, thereafter tipped to a deliver position. From this position eggs are collected at a collecting station during the downward movement of the chain and transferred to a belt conveyor.

3,770,108

TENSIONING DEVICE FOR WIDE MOVING BELTS

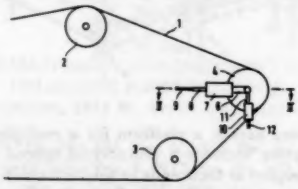
Hubert Ettel, Teichhutte/Harz, Germany, assignor to Wilhelm Mende & Co., Teichhutte/Harz, Germany

Filed Mar. 21, 1972, Ser. No. 236,690

Claims priority, application Germany, Mar. 26, 1971, P 21 14 835.6

Int. Cl. B65g *15/30*

U.S. Cl. 198—208 **3 Claims**



A tensioning device for a steel conveyor belt running over a drum or pulley which insures uniform tension over the entire width of the belt to prevent cracking the belt due to concentrated stress. The device comprises hydraulic cylinders, one at either end of the drum axle to adjust tension by moving the drum, and a regulating cylinder acting on the axle in a direction perpendicular to the force of the tensioning cylinders which responds to lateral deflections of the belt and tilts the drum to cause the belt to return to its normal mean position. The tensioning cylinders are connected to a common fluid supply conduit of larger diameter than the conduit connecting to the source of fluid to insure equal pressure in both cylinders in any tilted position.

3,770,109

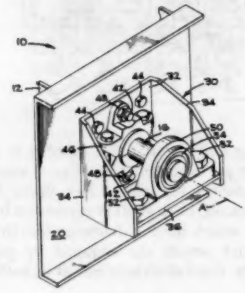
SCREW CONVEYOR SHAFT SUPPORTING STRUCTURE

Robert E. Kraft, Naperville, Ill., assignor to FMC Corporation, San Jose, Calif.

Filed June 8, 1972, Ser. No. 260,941

Int. Cl. B65g *33/24*; F16f *15/00*

U.S. Cl. 198—213 **9 Claims**



A screw conveyor is disclosed with an end plate having an opening through which the shaft of the screw extends. The end plate has mounting holes symmetrically arrayed around the opening for the shaft to receive either an end plate bearing to support the shaft, or a bracket having a shelf on which a pillow block is mounted to support the shaft. The bracket can be mounted in a selected orientation to position the pillow block according to the requirement of a particular installation. A shaft seal is mounted on the bracket over the shaft opening.

3,770,110

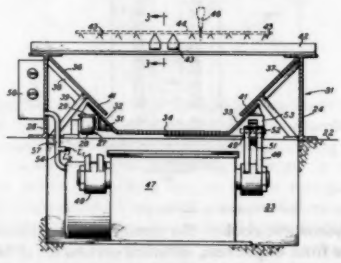
BURN-CUTTING APPARATUS

Peter P. Boskovitch, Hammond, Ind., assignor to Goodman Equipment Corporation, Chicago, Ill.

Filed Jan. 21, 1969, Ser. No. 792,372

Int. Cl. B65g *27/00*

U.S. Cl. 198—220 DA **1 Claim**



Apparatus for supporting metal plates and sheets during torch-cutting operations and for receiving, storing and carrying away the waste scrap and slag materials. A stationary,

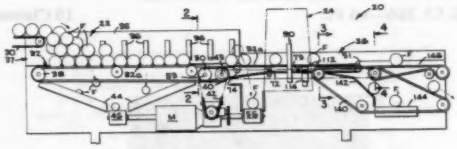
elongated work table provides support during cutting and is open for scrap and slag to fall through. An elongated trough beneath the work table receives and stores waste materials. Periodically, the operator actuates a drive mechanism which converts the storage trough to a shaker conveyor for carrying the material away to a discharge point.

3,770,111

APPARATUS FOR SORTING FRUIT ACCORDING TO COLOR

Charles S. Greenwood, Santa Clara, and Donald W. Chamberlin, Los Gatos, both of Calif., assignors to FMC Corporation, San Jose, Calif.

Filed May 3, 1972, Ser. No. 249,925
Int. Cl. B07c *5/342*
U.S. Cl. 209—73 **19 Claims**



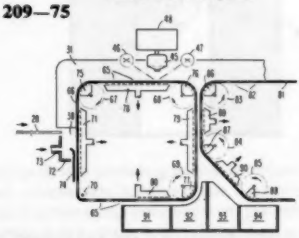
Apparatus for sorting fruit according to the color thereof includes a conveyor which is arranged to receive fruit in bulk, singulate the fruit into a randomly spaced arrangement, and transport the fruit through a sorting head to a discharge station where the fruit can be discharged to one of three locations in accordance with its color characteristics as determined by the sorting head. This head includes a plurality of lights for illuminating the surface of the fruit as it passes through the head and a ring spaced radially from said conveyor which is adapted to mount the inlet ends of a plurality of fiber light guides so that they define a cylindrical band. The outlet ends of the light guides are brought together into bundles to direct the light reflected from the fruit to two photodetectors. Signals from these photodetectors operate a pair of solenoids and a pair of associated air blast means at the discharge station to selectively tilt certain fruit off the conveyor.

3,770,112

METHOD OF AND APPARATUS FOR SORTING TOBACCO LEAVES

Emil S. Asfour, Herrliberg/ZH, Switzerland, assignor to Technical Development Corporation, Pfaalkon, Switzerland

Filed Sept. 16, 1971, Ser. No. 181,160
Claims priority, application Switzerland, June 16, 1971, 8766/71
Int. Cl. B07c *5/342*
U.S. Cl. 209—75 **11 Claims**



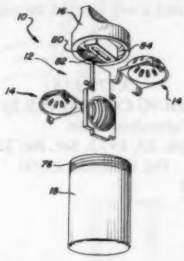
Apparatus for sorting leaves, particularly tobacco leaves, has a vibrating type conveyor provided with successive surfaces of different inclination to separate the leaves in the longitudinal direction of their motion. After separation the leaves are passed through a sorting station which separates foreign bodies. The leaves are then passed to a sorting station where they are classified, by an optical device according to color differences.

3,770,113

CONTACT LENS HOLDER

Michael D. Thomas, Elmhurst, Ill., assignor to MCD Corporation, Bensenville, Ill.

Filed Mar. 3, 1972, Ser. No. 231,665
Int. Cl. A45c *11/00;* **B08b** *11/00*
U.S. Cl. 206—5 A **14 Claims**



A lens holder is disclosed that includes a base having first and second corresponding convex surfaces on opposite sides with a pivot axis on the base adjacent the surfaces. First and second cover members of identical construction cooperate with opposite sides of the base and are pivoted on the pivot axis. The identical cover members each include a concave surface corresponding in configuration to the convex surfaces on the base and a pair of arms on one end of each cover member that define pivot surfaces. The pivot surfaces receive the pivot axis and the arms are positioned so that the first and second cover members have lateral edges aligned with each other, when the arms of the cover members are operatively engaged with the pivot axis. The cover members each include latch means releasably retaining the cover member in a closed position on the base in which the convex and concave surfaces are in juxtaposed relation to each other. The base is removably secured to a cap and the cap is adapted to be removably coupled to a container with the cap, base and cover positioned to locate the base in the container when the cap is coupled to the container. In addition, the cap defines a maximum pivoted position for the cover members when it is secured to the container to prevent separation of the cover members from the base, while the cover members can readily be separated from the base when the base is removed from the cap.

3,770,114

CONVERTIBLE CASE

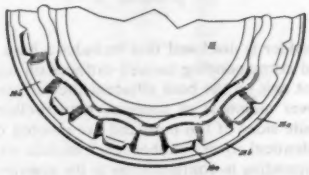
Vivian G. Jackson, 828 Five Oaks Ave., Dayton, Ohio

Filed July 19, 1971, Ser. No. 163,975
Int. Cl. B65d *7/28, 85/18*
U.S. Cl. 206—8 **6 Claims**

A combination wig and make-up case includes an inner section which is nested within the bottom section of the case and

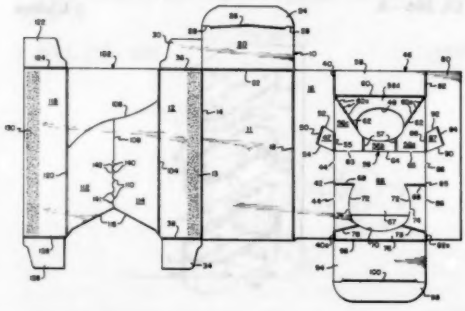
is preferably fitted with wig accessories, such as a wig form, mounting spindle and wig brush. The bottom section of the case and a cover are hinged together along their edges by means of complementary hinge sections and a removable pin or pins. The fitted inner section is also provided with hinge sections complementary to the hinge sections on the bottom section of the case so that the cover can be detached from the bottom section and the inner section, which has appreciably greater depth than the cover, attached to the bottom section in place of the cover to provide greater overall depth to the case. In this configuration the wig form may be mounted upright in the case and a wig carried thereon styled or dressed and ready for wear.

3,770,115
PACKAGING CONTAINER FOR PIES
James N. Cannell, Columbus, Ohio
Filed Feb. 23, 1972, Ser. No. 228,606
Int. Cl. B65d *25/00*
U.S. Cl. 206—45.32 **7 Claims**



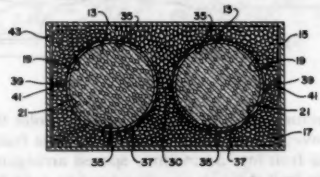
A packaging container for shipping and displaying pies consisting of a shock-absorbing base shell of concave form which receives and supports the usual pie pan in such a manner that shocks will not be readily transmitted to the pie in the pan and a convex cover which snaps onto the base shell and grips the flange or rim of the pan. The cover is transparent so that the pie in the pan can be seen. The cover is of sufficient vertical extent or depth that it will cover the pie without contacting with the pie filling. The base shell and cover are complementally formed so that the container assemblies can be stacked without likelihood of being displaced laterally relatively, the shell of one assembly resting on and interfitting with the cover of the assembly next below. The base shell and cover are both formed to resist downward crushing forces.

3,770,116
DISPLAY CARTON
Raymond A. Cote, Charlotte, N.C., assignor to Riegel Paper Corporation, New York, N.Y.
Filed Oct. 12, 1971, Ser. No. 188,341
Int. Cl. B65d *5/50*
U.S. Cl. 206—45.14 **8 Claims**



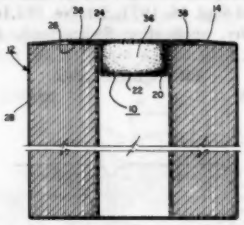
A blank is provided for an article display carton and the like having a double front wall construction with an intermediate front wall panel configured to define a resilient nesting and holding arrangement for an article to be displayed, and an outer front wall configured to break open upon the insertion of the article thereagainst, and to coact with the intermediate front wall panel to hold the article firmly in place while simultaneously framing the article. In addition, certain specific nick arrangements are provided for enabling initial erection of the carton into tubular form while providing easy break-away from tubular form upon insertion of the article to be displayed.

3,770,117
DISPOSABLE SHIPPING CONTAINER FOR CONCRETE SAMPLES
Harry L. Brewer, Jr., Memphis, Tenn.
Filed Apr. 14, 1972, Ser. No. 244,039
Int. Cl. B65d *7/00, 85/00*
U.S. Cl. 206—46 FC **10 Claims**



A disposable container for preventing concrete test samples from being damaged while being shipped from a construction site to a testing lab. The polystyrene container includes internal openings to receive the test samples, water absorbent material lining the internal openings for maintaining moisture adjacent the test samples, and water passages leading to the internal openings to allow water to be introduced to the test samples.

3,770,118
PACKAGING SYSTEM
Drexel D. Jones, Thornton, Pa., assignor to Scott Paper Company, Delaware County, Pa.
Filed Feb. 7, 1972, Ser. No. 224,085
Int. Cl. B65d *71/00, 79/00, 85/62*
U.S. Cl. 206—47 R **9 Claims**



A packaging system includes a cored web product, such as a roll of sanitary tissue; and an article-containing package having an article-containing compartment in which an article, such as a give-away premium, is contained, and a peripheral rim disposed adjacent one end of the compartment. The article-containing compartment is disposed within an opening in the cored product, and the peripheral rim engages an outer surface of the cored product. A flexible overwrap material is secured tightly about the cored product and article-containing package to grip the peripheral rim of the article-containing

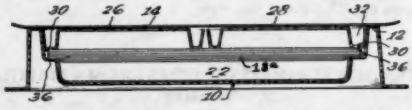
package between the outer surface of the cored product and the overwrap material. Several cored products can be packaged within a single overwrap material, and an article-containing package can be assembled with one or more of the cored products.

3,770,119

MEDICAL PROCEDURE TRAY

Wayne M. Hultberg, Glenview, and James L. Cabernoch, Buffalo Grove, both of Ill., assignors to Baxter Laboratories, Inc., Morton Grove, Ill.

Filed Aug. 23, 1971, Ser. No. 173,941
Int. Cl. A61b *19/02*; B65d *1/34*
U.S. Cl. 206—63.2 R **5 Claims**



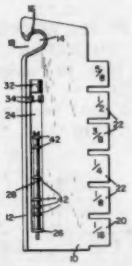
A sterile, medical procedure tray is disclosed, comprising a tray body having a raised rim about its periphery, and a sterile drape attached to the tray body and folded together within the rim. A gas-permeable, contamination-impermeable sheet is releasably attached to the periphery of the rim to aseptically enclose the drape and the tray body interior within the rim. Auxiliary trays can be provided which hook to the tray body to provide additional tray space.

3,770,120

MERCHANDISE DISPLAY WITH INVENTORY CONTROL

Henry Lloyd Hanson, Worcester, Mass.

Filed Oct. 31, 1972, Ser. No. 302,521
Int. Cl. B65d *5/50*, *73/00*
U.S. Cl. 206—79 **5 Claims**



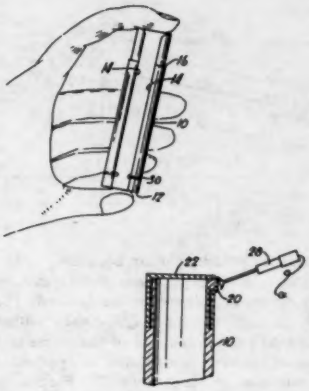
A display device including means to support a series of superposed merchandise holding cards, each article of merchandise in each series being different from the other articles of the same series, a tab on each card indicating a parameter of its particular article, each tab being offset from all the other tabs in a series, so that all the tabs are visible, and an elongated opening in each card, an elongated member extending from an end of each opening along the opening, a tube for each article, each tube being mounted on an elongated member, said elongated member being of varying lengths dependent upon the lengths of the articles, means for yieldably snap-holding the tube and its article in position on the card, and a flange on each card adjacent the opening therein.

3,770,121

BANK COIN PACK

Charles Manuel, Toronto, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Sept. 5, 1972, Ser. No. 282,237
Int. Cl. A45c *11/28*
U.S. Cl. 206—.82 **2 Claims**



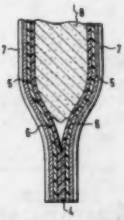
An elongated plastic cylinder sealed at one end and open at the other has an axially extending slot in the wall extending along the entire length of the cylinder from the closed to the open end. The outer surface of the wall adjacent the open end is reduced in diameter relative to the diameter of the outer surface over the rest of the cylinder. A cap detachably fits over the open end with the outer surface of the cap flush with the outer surface of the remainder of the cylinder.

3,770,122

FLEXIBLE LAMINATED PACKAGE

Guenther Thiele, Munster, Germany, assignor to Glasurit Werke M. Winkelman GmbH, Hamburg-Wandsack, Germany

Filed May 14, 1971, Ser. No. 143,444
Claims priority, application Germany, May 16, 1970, G 70 18 463.3; May 16, 1970, P 20 24 178.5; May 16, 1970, P 20 24 179.6; Austria, May 19, 1970, 4479/70; May 19, 1970, 4480/70; May 15, 1970, 4400/70
Int. Cl. B65d *81/00*
U.S. Cl. 206—84 **7 Claims**

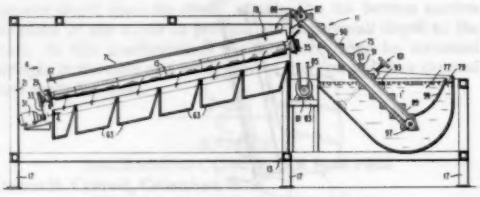


A flexible laminated package for highly viscous or pasty compositions containing organic solvents, wherein the package has a first multi-layer laminate and a second multi-layer laminate, each of which laminates are composites of at least two joined films wherein the inner film which is in direct contact with the viscous or pasty compositions is a polyalkylene film and the outer film is a polyamide and the multi-layer laminates are heat sealed at the edges.

3,770,123
METHOD AND APPARATUS FOR GRADING SHRIMP

Joseph Mraz, Plant City, Fla., assignor to Mraz Research Center, Ltd., Plant City, Fla.

Filed Aug. 13, 1971, Ser. No. 171,609
Int. Cl. B07c *1/10*
U.S. Cl. 209—107 12 Claims

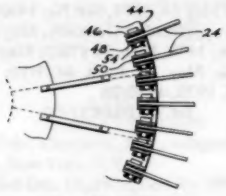


An apparatus for grading shrimp according to size wherein pairs of spindles having precisely cylindrical sections of progressively decreasing diameter are utilized. The spindles are generally parallel, extend longitudinally within a frame sloping downwardly from one end of the frame to the other, and the pairs of spindles are rotated in opposite directions with facing surfaces moving upwardly. Precise grading of shrimp may be accomplished with one pass through the machine. A loading conveyor is provided to control the rate of feed of shrimp delivered to the spindles. Collecting devices are employed to keep separate shrimp falling through the grading regions of different size.

3,770,124
SWING BACK WHIZZER BLADES FOR MECHANICAL AIR SEPARATOR

Gustav Herbert Frangquist, Mount Prospect, Ill., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 21, 1971, Ser. No. 210,340
Int. Cl. B07b *7/083, 11/04*
U.S. Cl. 209—139 A 1 Claim



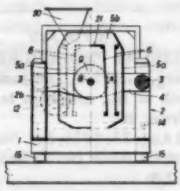
A mechanical separator, for selectively dividing an already finely divided solid into two products of different fineness, in which the whizzer blades are pivotally mounted, so that the separator setting for wide variations in fineness can be quickly and easily changed.

3,770,125
OSCILLATORY SCREENING APPARATUS WITH VERTICAL SCREEN CHANNEL

Johann Schober, Franz-Arnfelsergasse 16, 8200 Gleisdorf, Austria

Continuation-in-part of Ser. No. 785,489, Dec. 20, 1968, abandoned. This application July 2, 1971, Ser. No. 159,483
Claims priority, application Austria, Dec. 22, 1967, 11651/67
Int. Cl. B07b *1/28*
U.S. Cl. 209—252 10 Claims

The side walls of an oscillatory screening box support a pair of associated screens defining therebetween a vertical screening channel of funnel shape. Granular material is gravity fed through the channel to an open outlet and a transverse screening motion is simultaneously imparted to the flowing material to screen fines out of the material through the screens. The oscillating drive for the assembly oscillates the same in a direction transverse to the vertical feed direction while maintaining an equilibrium of the mass.



3,770,126
SYSTEM FOR SEPARATING FIBRES FROM A FIBROUS SUSPENSION

Guy J. Jacquelin, Grenoble; Robert Hampartzoumian, and Jules Louvat, both of Rives, all of France, assignors to Societe Anonyme des Ateliers de Constructions Allimand, Rives, France

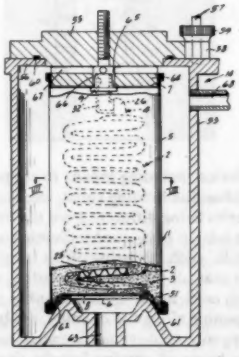
Filed Jan. 2, 1973, Ser. No. 320,462
Int. Cl. B01d *23/24*
U.S. Cl. 210—81 18 Claims

A system for separating fibre from a fibrous suspension by contacting the suspension with a receptacle having needles extending therefrom on which the fibres are caused to engage and are removed from the suspension.

3,770,127
CARTRIDGE-TYPE FILTER ELEMENT AND HOUSING THEREFOR

Eugene B. White, Oak Park, Ill., assignor to Filters International, Inc., Chicago, Ill.

Filed Nov. 4, 1971, Ser. No. 195,596
Int. Cl. B01d *27/10, 29/06*
U.S. Cl. 210—136 27 Claims



A cartridge-type filter element in which the filter structure is of envelope-type construction with spacing means therein,

the filter structure having a greater planar dimension in one direction than the corresponding dimension of a container in which it is disposed, and having a corrugated or serpentine configuration in transverse cross section along said greater dimension to permit such disposition, such container having therein a quantity of filter material in the form of discrete particles, present in an amount to provide an effective filter layer on such filter structure with the latter forming a supporting structure for such filter layer, novel housing means also being provided for one embodiment of such filter element.

3,770,128

DEVICE FOR TREATING AQUARIUM WATER

Mark D. Kast, 2423 Forest Park Blvd., Ft. Wayne, Ind.

Filed Feb. 23, 1972, Ser. No. 228,525
Int. Cl. E04h *3/20*
U.S. Cl. 210—169 **7 Claims**

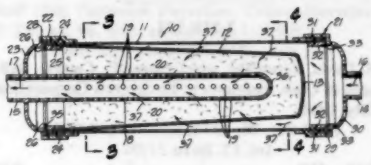
A device for inserting in an aquarium for the treatment of the water in the aquarium including filtration of the water, circulation of the water and aeration of the water as well as the selective supply of treatment materials to the water. A plurality of individual screen elements are arranged in vertical alignment and progressively decrease in mesh size in the upper direction and a fluid jet is directed upwardly toward the bottom of the lowermost screen element. The fluid jet, which may be air, flows upwardly through the screen elements and induces flow of aquarium water upwardly through the screen element whereby particulate material in the aquarium water will be filtered out and deposit on the bottoms of the screen elements. The water in the aquarium has free access to the underside of all of the screen elements and particles in the aquarium water, if small enough to pass through a lower, larger mesh screen element will be filtered out from the water in an upper, finer mesh screen element. The device according to the present invention is preferably in the form of a single unit which can be placed in submerged location in an aquarium, preferably centrally of a longer wall thereof and effects continuous cleaning and circulation of the aquarium water. The individual screen elements are advantageously contained within individual housing members and a screened cap is provided for one of the housing members so that it can be mounted on one end thereof and charcoal or a treatment medium, such as a soluble chemical material, can be placed between the screened cap and the screen element in the respective housing and thereby effect treatment of the aquarium water as flow thereof is induced through the respective screen element.

3,770,129

MANUALLY FLEXIBLE BLOOD FILTER

Robert C. Brumfield, Laguna Beach, and Edward E. Simmons, Pasadena, both of Calif., assignors to Williams Harvey Research Corporation, Santa Ana, Calif.

Filed May 15, 1972, Ser. No. 253,569
Int. Cl. B01d *29/08*
U.S. Cl. 210—232 **10 Claims**



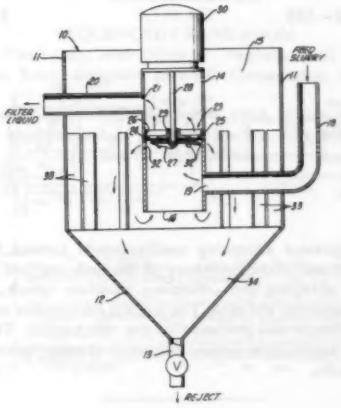
A length of elastomeric external tubing having a thin, blood impervious wall has a length of a blood permeable, flexible filter bag coaxially disposed inside. A first open terminus of the tubing and the bag open terminus are concentrically disposed together in a first closure means. A compressible filter mat is coaxially disposed inside the length of the filter bag and a flexible, elastomeric blood outlet collection manifold tube is coaxially disposed inside the filter mat. The manifold tube has an open terminus coaxially secured to a flexible elastomeric diaphragm of the first closure means, the first means providing a blood outlet conduit. A second closure means concentrically secures the second terminus of the elastomeric tubing, the second closure means providing the flexible blood filter a blood inlet conduit.

3,770,130

RECIRCULATING FILTER APPARATUS

Richard H. Brookins, Pomona, and John Paul Miller, Garden Grove, both of Calif., assignors to Brown International Corporation, Covina, Calif.

Filed July 14, 1972, Ser. No. 272,052
Int. Cl. B01d *29/42*
U.S. Cl. 210—305 **8 Claims**



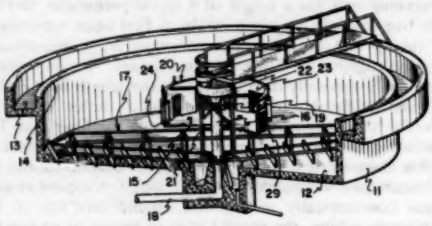
A power filter assembly including a rotary impeller positioned adjacent a filter screen is mounted in an upright tubular member. The tubular member is positioned concentrically within a settling tank. The lower end of the tubular member is open and communicates with the annular space between the tubular member and the tank wall. Inlet fluid to be filtered

passes directly into the tubular member above its open lower end and mixes with fluid drawn from the annular space. Filter liquid is discharged through an outlet above the power filter assembly. Ports in the side wall of the tubular member opposite the impeller discharge fluid radially into said annular space. Baffle means in the annular space prevent centrifugal motion of the fluid to promote settling of oversize solids into the conical lower end of the settling tank which is provided with a valved discharge opening.

3,770,131
FEEDWELL

Stevens S. Davis, Bountiful, and Spencer D. Cottam, Salt Lake City, both of Utah, assignors to Envirotech Corporation, Salt Lake City, Utah

Filed Oct. 20, 1971, Ser. No. 190,733
Int. Cl. B01d *21/00*
U.S. Cl. 210—519 **9 Claims**

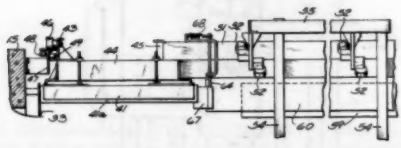


A tubular feedwell is centrally located in a sedimentation pool and the feedwell wall is provided with a plurality of elongated passages through which influent passes from the interior of the feedwell into the surrounding sedimentation pool.

3,770,132
SKIMMING MECHANISM FOR SQUARE TANKS

Gilbert W. Quast, Brookfield; Walter Poheim, Milwaukee, and Ernest J. Schultz, New Berlin, all of Wis., assignors to Rex Chainbelt Inc., Milwaukee, Wis.

Filed Mar. 27, 1972, Ser. No. 238,633
Int. Cl. B01d *21/00*
U.S. Cl. 210—525 **2 Claims**



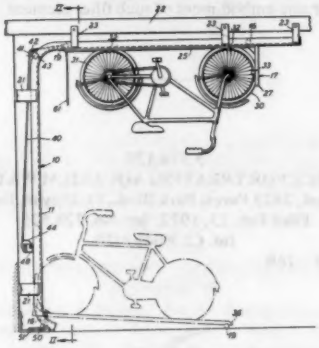
A conventional skimming mechanism is carried by and between a track at the periphery of the tank and one arm of the sludge scraping and collecting structure which rotates about the center of the tank. The track is rectangular and provides the directional guidance of the mechanism. The arm moves the mechanism around the track through telescoping support means.

3,770,133
BICYCLE STORAGE DEVICE

William A. Kolker, Downers Grove, Ill., assignor to Edward P. Miller, Downers Grove, Ill., a part interest

Filed Feb. 11, 1972, Ser. No. 225,424
Int. Cl. B62h *3/12*
U.S. Cl. 211—19 **17 Claims**

Storage device for bicycles and the like, storing bicycles off the floor along the wall or ceiling of a garage or like storage area. The device operates on the principle of a vertically sliding garage door opener and has a channeled track extending from the floor to the ceiling and along the ceiling. A bicycle rack having rollers at its advance and rear ends, which ride between the flanges of the channels of the track is positioned along the floor for loading with bicycles, strapped or otherwise

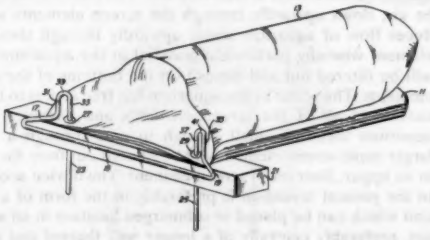


secured thereto, and is moved upwardly along the wall and ceiling of the garage under the control of a flexible cable, trained from a winding drum. A stop is provided to limit movement of the rack along the floor and prevent the advance rollers from coming off the rack as the rack moves along the floor.

3,770,134
OUTBOARD SPANNING SHOULDERED WICKETS

Vytautas Kupcikevicius, Chicago, Ill., assignor to Union Carbide Corporation, New York, N.Y.

Filed Apr. 24, 1972, Ser. No. 246,629
Int. Cl. B65h *3/58*
U.S. Cl. 211—57 **10 Claims**

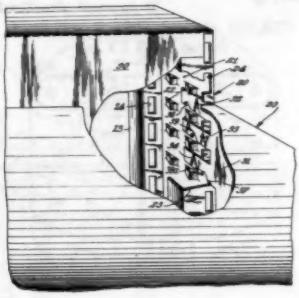


A shouldered wicket for holding a stack of flat flexible articles such as plastic packaging bags or sheets which are to be removed one at a time from the top of the stack, the shoulder portions of the wicket extending upwardly above the rest of the wicket to facilitate article removal from the wicketed stack and the horizontal bearing element of the wicket having a span greater than the linear distance between and across paired wicket holes in the stacked articles.

3,770,135
SHELVING CONSTRUCTION

Edwin F. Schild, Inverness, Ill., assignor to Airways Products Corporation, Schiller Park, Ill.

Continuation-in-part of Ser. No. 822,239, May 6, 1969, Pat. No. 3,626,870. This application Oct. 1, 1971, Ser. No. 185,797
Int. Cl. A47b *57/06*; A47f *5/10*
U.S. Cl. 211—148 3 Claims

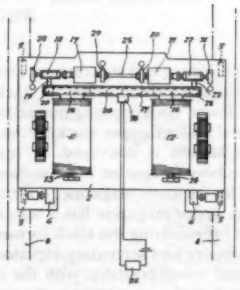


A shelving construction of the type wherein long rows of shelving are assembled from shelving units connected end-to-end. The shelving construction is provided with apparatus for connecting shelves to upright columns wherein the shelf supporting brackets are provided with extended lever arms and the columns are provided with embossments or lances for bearing against the extended lever arms for increasing the permissible moment of the shelf. The shelving unit is also provided with apparatus for securing and supporting the upright columns of the shelving units for connection on an end-to-end basis wherein the lower ends of the upright columns are provided with stiffening plates for increasing the rigidity thereof and the transverse supporting gussets are provided with members for aligning the end columns of adjacent shelving units and for supporting the aligned columns.

3,770,136
OVERHEAD CRANES

Herbert Fischer, Wolverhampton, England, assignor to Clarke Chapman-John Thompson Limited, Gateshead, County Durham, England

Filed Oct. 29, 1971, Ser. No. 193,645
Claims priority, application Great Britain, Nov. 3, 1970, 52,204/70; Nov. 10, 1970, 53,452/70
Int. Cl. B66x *17/00*
U.S. Cl. 212—10 9 Claims

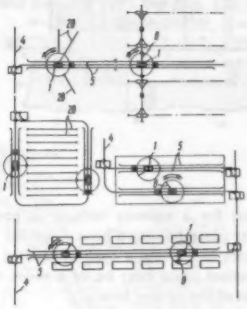


An overhead crane has two lifting drums rotating simultaneously to lift a load, the drive to the drums being in the form of a closed kinematic chain in which that part normally running idle includes a gear wheel mounted so that its axis is displaced when load is transmitted through it due to a failure in the other part of the chain. Said displacement operates a warning circuit whereby an indication of the failure is provided while the drive continues to be transmitted through said gear wheel.

3,770,137
OVERHEAD TRANSPORTER AND RELOADER

Ivan Ivanovich Slutsky, ulitsa akademika Komarova, 13, kv. 12, and Oleg Petrovich Poyarkov, Orlovo-Davydovsky per eulok 2/5, kv. 98, both of Moscow, U.S.S.R.

Filed Sept. 1, 1972, Ser. No. 285,859
Int. Cl. B66c *7/00*
U.S. Cl. 212—12 14 Claims

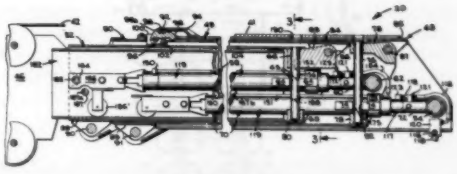


A transporter and reloader comprise an overhead rail track and a driven trolley travelling on said track. The over-head rail track consists of a central rail laid through-out the entire course of the trolley travel and of auxiliary rails provided at places of reloading of cargoes at both sides from the central rail but lower than the latter, the trolley resting on said auxiliary rails during reloading and swinging of the boom. Said trolley is provided with a boom turnable horizontally and a locator keeping said boom along the central rail when the trolley is running on the latter.

3,770,138
SEQUENCED CRANE BOOM

Paul A. Chalupsky, and Oliver T. Nephew, both of Cedar Rapids, Iowa, assignors to FMC Corporation, San Jose, Calif.

Division of Ser. No. 780,993, Dec. 4, 1968, abandoned. This application Apr. 15, 1971, Ser. No. 134,243
Int. Cl. B66c *23/06*
U.S. Cl. 212—55 14 Claims



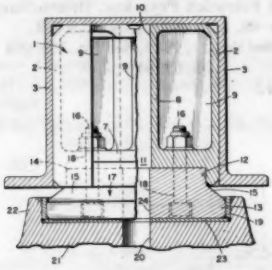
The invention concerns a hydraulically operated telescoping crane boom which is sequenced by means of a latch mechanism and sequencing valves such that the boom sections are automatically extended in order starting with the innermost section first. During retraction, the sequence is reversed; the outermost section being retracted first. Alternate forms are disclosed adding a manually operated section to the automatically operated boom and an entirely manually operated boom embodying the specific sequencing.

3,770,139

CAR BODY CENTER BRACE AND CENTER PLATE

Harry D. Glenn, Albany, Ohio, assignor to Buckeye Steel Castings Company, Columbus, Ohio

Filed Mar. 21, 1972, Ser. No. 236,746
Int. Cl. B61g 9/20; B61c 9/48
U.S. Cl. 213—57 **13 Claims**



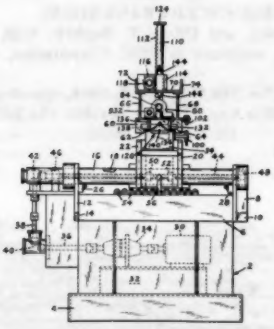
A center brace for a railway vehicle is provided with a detachable center plate having a boss disposed in a socket or recess in the center brace and a base of greater cross-section. The separable center plate may be of a more wear resistant material than that of the center brace.

3,770,140

SENSOR RESPONSIVE CYBERNETICS MACHINE

William J. Dukette, Palisades Park, N.J., assignor to American Associated Cybernetics, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 65,560, Aug. 20, 1970, abandoned, which is a continuation-in-part of Ser. No. 861,015, Sept. 25, 1969, abandoned. This application Sept. 23, 1970, Ser. No. 74,784
Int. Cl. B25j 9/00
U.S. Cl. 214—1 BB **26 Claims**



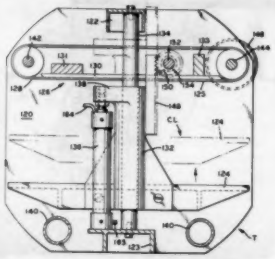
A machine for locating, engaging and moving an article located on a work surface. The machine includes a head movable in vertical, lateral and thrust axes, sensors along each such axis and programmer means for selectively sensitizing selected sensors to stop said head at selected positions along each such axis. In some embodiments the selected positions are manually predetermined while in other embodiments the selected positions are determined by sensors which locate the desired article.

3,770,141

APPARATUS FOR INVERTING STACKED UNITS OF SHEET MATERIAL

Ingvar L. Tolf; Vernon J. Herzing; Everett L. Miller, all of Battle Creek, and George L. Lightfoot, Bellevue, all of Mich., assignors to General Foods Corporation, White Plains, N.Y.

Division of Ser. No. 795,187, Jan. 30, 1969, Pat. No. 3,580,402. This application Jan. 18, 1971, Ser. No. 107,495
Int. Cl. B65g 7/00
U.S. Cl. 214—1 Q **1 Claim**



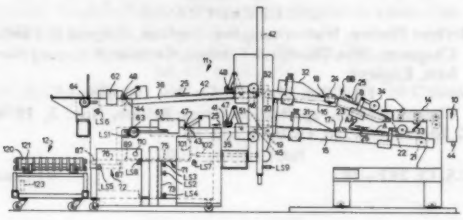
An inverting turret is adapted to receive stacked units of sheet material between opposed relatively movable clamping members, one of said clamping members also being operative as a stack conveyor. After a received stack is clamped to maintain stack integrity, said turret is rotated to invert the stack, whereupon the clamping mechanism is released and said one clamping member is activated to discharge the inverted stack from the turret.

3,770,142

REVERSE NESTED BLANK STACKER

Peter Zernov, and Thomas H. Gabel, both of Wauwatosa, Wis., assignors to Zerand Corporation, New Berlin, Wis.

Filed Sept. 29, 1972, Ser. No. 293,344
Int. Cl. B65g 57/16
U.S. Cl. 214—6 H **9 Claims**



A stacker for converting two separate streams of blanks into two separate stacks and for delivering the stacks to a delivery unit comprises a lower stack-forming magazine to which one stream is conveyed and an upper stack-forming magazine to which the other stream is conveyed. A primary elevator located below the lower magazine has a surface for receiving the stack formed by the lower magazine. A secondary elevator located below the upper magazine has a selectively operable conveyor surface for receiving the stack formed by the upper magazine. The primary and secondary elevators are movable between upper and lower positions with the surfaces of the primary and secondary elevators being in the same plane when both elevators are in lower position. A plunger is provided for moving a stack sideways from the surface of the primary elevator to the conveyor surface of the secondary elevator when both elevators are in lower position, i.e., when both stacks are formed. Means, such as a photo electric cell, are

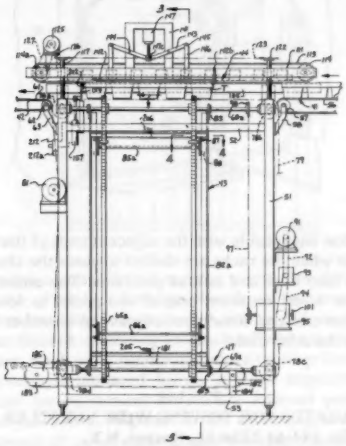
responsive to movement of a stack from the primary elevator onto the secondary elevator for initiating operation of the conveyor surface of the secondary elevator to move both stacks onto the delivery unit adjacent the discharge end of the stacker.

3,770,143

APPARATUS FOR TRANSFERRING TRAYS BETWEEN A CONVEYOR SYSTEM AND A STACK

Johnnie J. Breitbach, Normal, Ill.

Filed Nov. 4, 1971, Ser. No. 195,627
Int. Cl. B65g *60/00*
U.S. Cl. 214—6 DS **19 Claims**



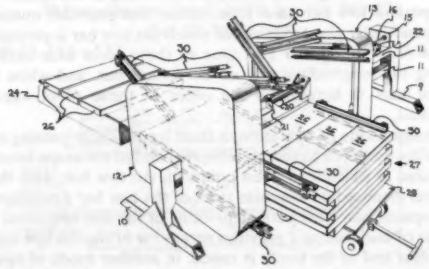
An apparatus for transferring baking trays and the like of ferromagnetic material between a tray conveyor system and a stack wherein an elevated tray conveyor system supports and advances articles laterally of a stack elevator which is operative to position the stack with the top tray at a level adjacent the tray conveyor, an endless type magnetic overhead conveyor overlies the elevator and the tray conveyor, and a tray transfer mechanism is provided for transferring trays between the overhead conveyor and the stack. The apparatus can be arranged to effect either a tray stacking or a tray unstacking operation.

3,770,144

CORRUGATED BOARD BUNDLE STACKER

Frank J. Di Frank, Toledo, Ohio, and Daniel L. Greiwe, Chicago, Ill., assignors to Owens-Illinois, Inc., Toledo, Ill.

Filed Dec. 6, 1971, Ser. No. 205,016
Int. Cl. B65h *29/40*
U.S. Cl. 214—6 DK **9 Claims**



Apparatus for receiving single or multiple bundles of corrugated board blanks from a corrugator in which the bundles are automatically picked up and in the preferred embodiment stacked on a cart, with alternate bundles being placed upside down with respect to the orientation of their delivery to the mechanism.

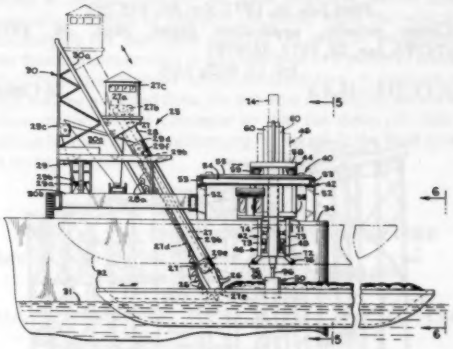
The disclosed mechanism is capable of handling full, corrugator width, single bundles of board or a plurality of less wide bundles at one time, thus obviating the necessity of having extremely high speed handling equipment or large off-bearer crews to handle the production from a corrugator. The bundles themselves, when stacked on the cart or truck, are placed in striated form for ease of unloading at another position.

3,770,145

PLOW APPARATUS FOR VESSEL UNLOADER

Morris B. Uhrich, Lansdale, Pa., assignor to FMC Corporation, San Jose, Calif.

Filed Dec. 27, 1971, Ser. No. 211,884
Int. Cl. B63b *27/00*
U.S. Cl. 214—14 **21 Claims**



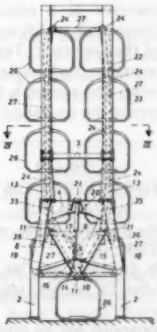
Plow apparatus is used with a high capacity unloading machine for removing bulk material from a barge or ship to move material into the path of the unloading machine for more complete removal of the material. The plow apparatus comprises one or more rotatable plow blades which are hoistable and movable laterally of the vessel so as to move the material on the sides of the vessel toward the center of the vessel.

3,770,146

PARKING ELEVATOR

Anders Erik Sundin, Forsa, Sweden, assignor to A E Sundin Produkter AB, Delsbo, Sweden

Filed Dec. 24, 1970, Ser. No. 101,247
Claims priority, application Sweden, Jan. 5, 1970, 92/70
Int. Cl. E04h *6/06*
U.S. Cl. 214—16.1 BB **5 Claims**



A parking elevator comprising two continuous chains formed by interconnected links and adapted to hoist or lower

cages in which vehicles are parked. Two drive wheels of polygonal configuration are adapted to drive the chains synchronously, these two drive wheels being positioned at the bottom part of the elevator. The chain links are interconnected by shafts in which the cages are suspended, these shafts also supporting guide rolls running in vertical guides supported on the elevator stand. The trailing end of each link presents a pressure surface, and follower means are provided at each apex of the two polygonal drive wheels for engagement in the pivot joint between two successive links of the chains and for pressing against these pressure surfaces.

3,770,147

MULTI-RACK STACKER SYSTEM

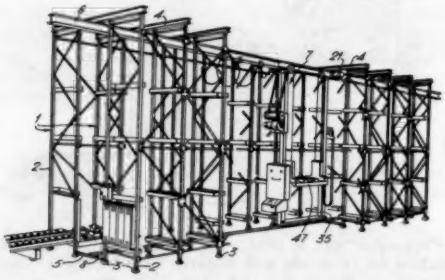
Ryoichiro Kito, Tokyo; Kazuo Maeda, Yokohama; Misumi Osawa, Tokyo; Nobuo Hayasaka, Kawasaki; Hisatsugu Watanabe, and Takenori Akaike, both of Tokyo, all of Japan, assignors to Kabushiki Kaisha Kito, Tama-ku, Kawasaki City, Japan

Filed July 26, 1972, Ser. No. 275,291

Claims priority, application Japan, Sept. 30, 1971, 46/75793; Jan. 28, 1971, 46/9781

Int. Cl. B65g *1/06*

U.S. Cl. 214—16.4 A **26 Claims**



A prefabricated multi-rack stacker system comprising double row multi-stacker shelves including support members each having at its lower end a base being adjustable to vary height of the support member in order to allow the system to be installed at a desired location which may be uneven in its floor surface. The support member is mounted on the base in a swingable manner more finely meet the above requirement. The system further comprising a plurality of detachable upper connecting members, a plurality of lower connecting members, an upper rail detachably mounted onto the upper connecting members and serves to guide and support upper end of an accumulation conveyor in a movable manner, and a detachably mounted lower rail, which serves to guide and support the lower end of the conveyor. The system is made in a prefabricated manner so that the installation at any desired location can be made ease. The system is further equipped with various aspects to improve the operation and function.

3,770,148

SCREW CONVEYOR SYSTEM FOR DURABLE PRESS APPARATUS

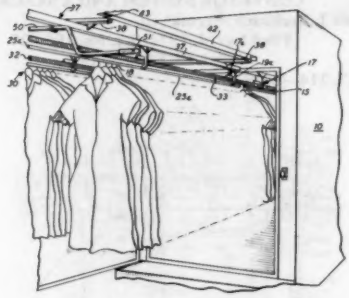
Charles W. Hendren, Reading, Ohio, assignor to McGraw-Edison Company, Elgin, Ill.

Filed Feb. 18, 1972, Ser. No. 227,409

Int. Cl. B65g *65/46*

U.S. Cl. 214—17 R **16 Claims**

A durable press apparatus has an oblong treating chamber with doors at the ends and with an internal screw conveyor for receiving wire hangers for articles to be treated. The screw conveyor comprises a pipe having a spiral peripheral groove or thread thereon for progressively advancing the hangers as the conveyor is rotated. The conveyor is supported by open-sided bearings each comprising a top bearing segment and two unopposed bottom segments to allow different types of hangers to move easily through the bearings. At the ends of the chamber there are load and unload racks having screw conveyors thereon engageable with the adjacent ends of the internal conveyor when the racks are shifted towards the chamber respectively into load and unload positions. The entire conveyor system is driven from one of the racks to load the chamber from one end simultaneously as the chamber is unloaded from the other end.



3,770,149

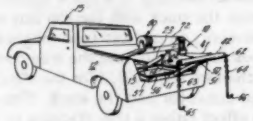
APPARATUS FOR TOWING WIDE VEHICLES

Joseph Aquila, 144-41 231st St., Queens, N.Y.

Filed Nov. 26, 1971, Ser. No. 202,200

Int. Cl. B60p *3/12*

U.S. Cl. 214—86 A **19 Claims**



Truck mounted crane-type apparatus for towing relatively wide and heavy wrecks or otherwise disabled vehicles is constructed with an adjustable length spacer bar extending from the rear of the towing vehicle and secured to the towed vehicle to maintain these vehicles spaced apart especially during turning. The rear end of the spacer bar is mounted to a generally horizontal pivot disposed at right angles to the longitudinal axis of the towing vehicle, and the front end of the spacer bar supports a tow bar on a joint means that provides mutually perpendicular pivot axes about which the tow bar is pivotable, relative to the spacer bar. One of these pivot axes extends along the longitudinal axis of the spacer bar, and when this pivot axis is horizontal, the other of these pivot axes is vertical.

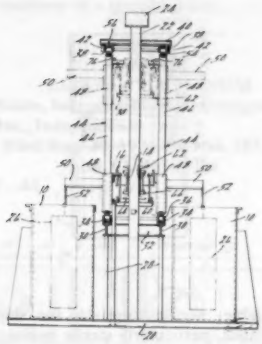
In one mode of operation, a fixed length cable passing over a pulley mounted to the movable rear end of the crane boom is secured at its ends to fixed points on the tow bar, with these points disposed on opposite sides of the tow bar conection to the spacer bar. This permits pivoting of the tow bar about the other of said axes and provides means for lifting the tow bar as the rear end of the boom is raised. In another mode of operation, the fixed length cable is replaced by a winch having a cable which passes over a guide pulley secured to the boom at the rear end thereof, with this cable being secured to the tow bar at the same spaced points where the ends of the fixed length cable were secured.

3,770,150

WORK CARRIER LIFT AND TRANSFER MECHANISM

Chester G. Clark, Grosse Pointe Woods, Mich., assignor to Oxy Metal Finishing Corporation, Warren, Mich.

Filed Dec. 8, 1971, Ser. No. 205,987
Int. Cl. B66b 17/00; B23q 7/00; B65g 35/00
U.S. Cl. 214—89 11 Claims



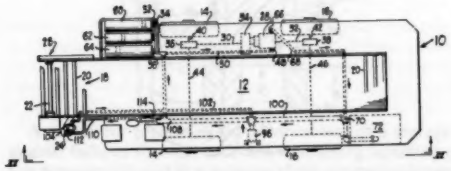
A work carrier lift and transfer mechanism for a conveying machine of the type having a plurality of interconnected work carriers movably mounted on a framework including guide means thereon extending longitudinally of a series of treating stations. Each work carrier includes a carriage frame on which a carriage is mounted having a work supporting member thereon for movement between a lowered position and a raised position in response to the ascending and descending movement of an elevator chassis incorporating a lift member thereon adapted to engage a supporting member on the carriage at selected ones of the several treating stations to enable a transfer of the workpieces above the partitions separating adjoining treating stations. The elevator chassis incorporates a reciprocable transfer mechanism including at least one transfer member engageable with an engaging member on the carriage frames for effecting an intermittent advancement of the work carriers when the chassis is in the elevated position from one station to the next adjoining treating station. The transfer members are arranged at substantially uniform intervals in order that the transfer force applied to the carriage frames is distributed substantially uniformly along a chain interconnecting the work carriers.

3,770,151

FLUID PROPELLED MINE HAULAGE VEHICLE AND METHOD FOR UNDERGROUND HAULAGE

Will B. Jamison, Bethel Park, Pa., assignor to Consolidation Coal Company, Pittsburgh, Pa.

Division of Ser. No. 158,829, July 1, 1971, Pat. No. 3,712,489.
This application July 7, 1972, Ser. No. 269,521
Int. Cl. B60p 1/38
U.S. Cl. 214—152 1 Claim



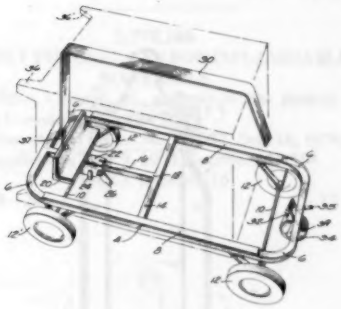
The underground mine haulage vehicle is particularly adapted for use as a shuttle vehicle between a continuously advancing loading station and a fixed discharge station to transport material dislodged by the continuous mining machine at the loading station to fixed conveying apparatus at the discharge station. The mine haulage vehicle has a mobile body with pairs of front and rear traction wheels. A fluid actuated motor is connected through suitable driving connections to the traction wheels. Accumulators having fluid under pressure therein are connected to the fluid actuated motor and the fluid under pressure from the accumulators actuates the fluid motor and propels the shuttle vehicle. The fluid circuit includes a fluid inlet connection to the accumulators and a fluid outlet connection from a reservoir. At a recharging station located adjacent to the fixed discharge station a suitable recharging device is provided for recirculating the fluid from the reservoir to the accumulators and compressing the gas in the accumulators to recharge the accumulators with fluid under pressure. Other embodiments include providing a pump on the haulage vehicle to transfer the fluid from the reservoir to the accumulators and recharing the accumulators with fluid under pressure A separate electric motor for the recharging pump is located adjacent the fixed discharge station and is connected thereto to energize the pump while the vehicle is discharging the dislodged material. In another embodiment the fluid actuated motor is also operable as a pump to transfer fluid from the reservoir to the accumulators. A separate circuit may be provided from the external recharging means to a drive motor for the conveyor so that the conveyor may be driven by the external recharging means while the fluid system is being repressurized.

3,770,152

DOLLY FOR TV SET OR STEREO OR THE LIKE

Lewis C. Niemuth, Rt. 1, Larsen, Wis.

Filed Dec. 1, 1971, Ser. No. 203,781
Int. Cl. B62b 1/06
U.S. Cl. 214—374 2 Claims



A dolly frame with four easily turning wheels carries two separate hoists, one of which is a windlass and the other a jack, the two hoists working in unison in lifting a workpiece and transporting it. An optionally useable addition involves a freely detachable and connectable belt unit for climbing stairs.

3,770,153

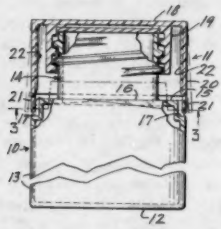
SAFETY CLOSURE

Peter P. Gach, Evansville, Ind., and Henry K. Leonard, Toledo, Ohio, assignors to Sunbeam Plastics Corporation, Evansville, Ind.

Continuation-in-part of Ser. No. 232,161, March 6, 1972, abandoned. This application Aug. 4, 1972, Ser. No. 278,101
Int. Cl. B65d 55/02
U.S. Cl. 215—9 10 Claims

A safety closure for a container is disclosed. The container has a threaded neck, a shoulder, and one or more lug recesses

and preceding camming surfaces on the periphery of the shoulder. The cap has an internally threaded inner wall and an outer, flexible, spaced concentric skirt. The skirt has one or more downwardly protruding lugs on its lower edge. Rotation of the cap relative to the bottle causes the lug to engage a camming surface. Continued rotation of the cap leads the lug into the lug recess, releasably locking the cap upon the container neck. The cap is removed by first applying an inward



squeezing force to the cap skirt thereby flexing the lug outwardly to disengage the lug from the lug recess after which the cap can be rotated freely in a direction to unscrew the cap. In another embodiment, the container neck and cap have one or more partial threads so that the cap is thrust onto the neck which also cams the lug or lugs outwardly and then the cap is turned through only a partial revolution to engage the threads and move the lug into the recess.

3,770,154

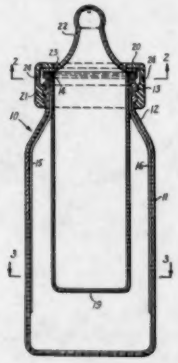
NURSING BOTTLE

Elmer W. Johnson, 451 East 9th Ave., Chico, Calif.

Filed Aug. 5, 1971, Ser. No. 169,358

Int. Cl. A61j *9/04*

U.S. Cl. 215—11 B **1 Claim**



A nursing bottle supporting a collapsible container and with its cap securing a nipple thereto. An air inlet ring is mounted on a pair of members which extend into the bottle outside the insert to hold the ring in position as the bottle is being assembled. The air inlet ring is corrugated on the bottom side to prevent its sealing with the bottle to permit air to flow into the space between the bottle and the insert.

In a modified form of the invention the insert is folded over the threaded top of the bottle and the cap, holding the nipple, is threaded over the insert to seal the insert to the top of the bottle and the nipple. The bottle is perforate to admit air as the collapsible insert collapses.

3,770,155

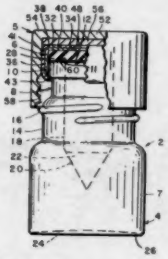
DUALLY SEALABLE, NON-LEAKING VIAL FOR SHIPPING RADIOACTIVE MATERIALS

Howard Novitch, Walnut Creek, Calif., assignor to New England Nuclear Corporation, Boston, Mass.

Filed Oct. 19, 1971, Ser. No. 190,490

Int. Cl. B65d *51/22*

U.S. Cl. 215—37 R **6 Claims**



A dually sealable, non-leaking vial for shipping liquid radioactive materials, particularly sterile radioactive materials, and other sterile liquid materials in which the mouth of the vial, as shipped, is sealed by a needle pierceable septum seal and in which a threaded cap is located and held over the septum seal and mouth with the threads thereby held out of engagement with mating threads on the vial by the septum seal. However, upon removal of the septum seal after shipment, the threads of the cap mate with the threads of the vial whereby the cap can be removabley threaded tightly over the mouth to seal it.

The capped and septum-sealed loaded vial is placed in a heat shrinkable plastic envelope having a bottom end wall and an upstanding cylindrical wall of greater height than the capped, septum-sealed vial and of lesser thickness than the bottom end wall and the envelope is heat shrunk circumferentially, tightly and sealably around the capped septum-sealed vial with the upper part of the envelope being shrunk circumferentially and downwardly tightly over the margin of the upper surface of the cap to securely seal the capped septum-sealed vial.

3,770,156

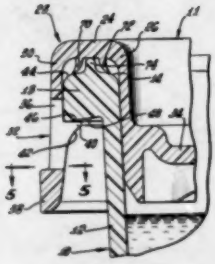
TAMPER PROOF CLOSURE

George Yates, Jr., Glendale, Calif., assignor to Growth International Industries Corp., Cleveland, Ohio

Continuation of Ser. No. 883,694, Dec. 10, 1969, abandoned. This application Nov. 26, 1971, Ser. No. 202,705

Int. Cl. B65d *55/02*

U.S. Cl. 215—41 **10 Claims**



A tamper proof closure for use on an open end container body includes a flexible peripheral outer leg in which are pro-

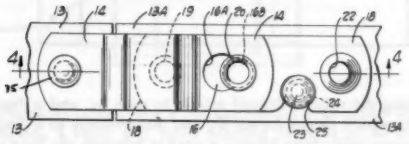
vided a plurality of centrally positioned slots, with a continuous bead at one end portion. A bead projecting inwardly from the outer leg has a cam follower surface functioning only during the engagement of the container body and the closure which assures easy engagement, while an abutment surface insures against disengagement. Disengagement can be achieved but cutting the continuous bead so that the outer leg can be pivoted out of locking engagement with the container. After the bead is cut, the closure can still be used for hermetically sealing the container on a reusable basis.

3,770,157

LINKAGE MECHANISM

William O. Setele, Independence, Ohio, assignor to Kendale Industries, Inc., Independence, Ohio

Filed Sept. 30, 1971, Ser. No. 185,207
Int. Cl. B65d *9/02*
U.S. Cl. 217—44 **11 Claims**



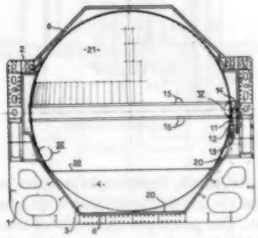
A linkage mechanism for coupling walls of a container such as for interconnecting the sections of a hogshead or like container. There is provided link members connected to adjacent wall sections of a hogshead or like container, which link members interconnect and cooperate to draw the wall sections together and to hold them in assembled position, and which permit separation of the wall sections as desired. This is an abstract only of the specific illustration of the invention given by way of example, and is not to be used in the interpretation of the claims nor as a limitation on the scope of the invention.

3,770,158

DEVICE FOR PROTECTING THE ENVIRONMENT OF A TANK AGAINST FAILURES THEREOF

Jean H. Alleaume, Saint-Cloud, France, assignor to Technigaz, Paris, France

Filed Oct. 29, 1971, Ser. No. 193,798
Claims priority, application France, May 24, 1971, 7118702
Int. Cl. B65d *25/18*
U.S. Cl. 220—9 LG **7 Claims**



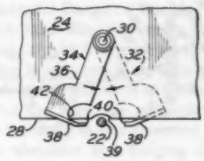
A device for protecting the environment of a storage tank against failures thereof, said tank containing liquefied gas at low temperature and at a pressure about atmospheric pressure and being housed in a heat-insulated compartment of a ship hold, said device comprising a fluid-tight, concave dished structure forming a reduced secondary barrier arranged below and about the lower portion of said tank.

3,770,159

TEMPORARY FILE SUPPORT AND PLACE INDICATOR

Gladys E. Dunlap, 107 North Franklin Street, Delaware, Ohio

Continuation-in-part of Ser. No. 17,217, March 6, 1970, abandoned. This application Dec. 20, 1971, Ser. No. 209,798
Int. Cl. B65d *25/06*; B42f *17/14*
U.S. Cl. 220—22.5 **1 Claim**



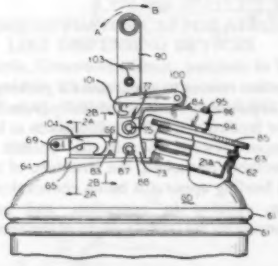
A movable support means for supporting paper folders or individual pieces of paper in upright position within a file drawer where the drawer has a rod running horizontally along its bottom. The rod runs down the center of the drawer and is recessed slightly below the drawer bottom in a groove. The support includes a panel and a pair of co-operating bracket means, one on each side of said panel. The panel is adapted to be inserted within a file drawer substantially parallel with the folders and substantially perpendicular to the rod. The bracket means are attached to the lower portion of the panel by a rivet or other attaching means which allow said brackets to rotate about a common axis substantially perpendicular to said panel. In operative position the bracket means include a leg extending upward from below the bottom of the panel to a spot intermediate the bottom and top of said panel. A foot portion on the lower end of the leg portion extends transverse to the leg portion and is adapted to fit beneath the rod to brace the panel against tilting. An upturned sloped portion on the forward end of the foot position serves to prevent gouging of the bottom of the drawer when the foot portion slips under the rod.

3,770,160

SAFETY DISPOSAL CAN FOR INFLAMMABLE MATERIALS

Frank S. Flider, Chicago, Ill., assignor to The Justrite Manufacturing Company, Chicago, Ill.

Continuation-in-part of Ser. No. 98,557, Dec. 16, 1970. This application June 9, 1971, Ser. No. 151,354
Int. Cl. B65d *43/16*
U.S. Cl. 220—36 **12 Claims**



A completely enclosed plastic can or container has a large mouth opening, closed by a cap under the pull of a substantial spring bias. The cap may be secured in an open position against the pull of the bias spring. The cap is selectively controlled by a handle and linkage connected to a vertical fin formed on the can, preferably by an enlargement of the parting or flash line between two mold parts. Preferably, the container is made by a blow molding process.

3,770,161
CAN OR CONTAINER AND THE LID THEREFOR

Elmer J. Knize, Chicago, Ill., assignor to Lippy Can Co., Ltd., Chicago, Ill.

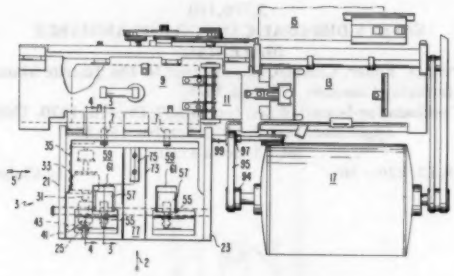
Filed Nov. 17, 1971, Ser. No. 199,520
Int. Cl. B65d *41/00*
U.S. Cl. 220—42 C 4 Claims

A container having a rim with an inner vertical wall at the top thereof and a lid applied to the rim for closing and sealing the can, wherein the lid has a concave or dished surface with a peripheral short annular downwardly extending bend merging into a vertical wall so that when the pressure inside the can increases it will cause the concave or dished surface of the lid to straighten and apply an outward lateral pressure against the vertical wall of the lid, which correspondingly applies an outward lateral pressure against the vertical wall of the rim to retain the lid on the rim.

3,770,162
CARD FEEDING APPARATUS

Frank A. Houghton, Detroit; Leonard Wasielewski, Garden City, and James L. Kinner, St. Clair Shores, all of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Apr. 21, 1972, Ser. No. 246,433
Int. Cl. G07f *11/00*
U.S. Cl. 221—13 13 Claims



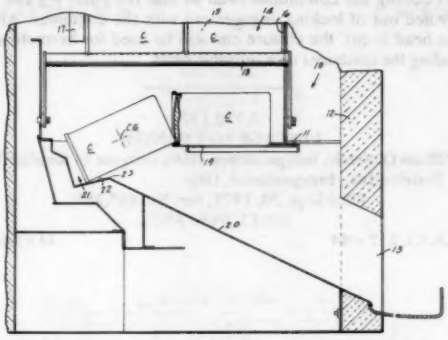
This invention relates to apparatus for picking record documents such as punched cards individually from the bottom of a stack and for feeding the individual records at high speed to a record transport system wherein the records are processed and then ejectably restacked, the structure of the high speed picking and feeding apparatus being economical to build and to maintain, reliable in operation, and predisposed to minimize damage to the trailing edges of the records.

3,770,163
SEQUENTIAL ARTICLE VENDING MECHANISM FOR PLURAL SOURCES

Edward H. Guthrie, R.R. 5, Box 23, Scottsboro, Ala.

Filed Feb. 11, 1972, Ser. No. 225,425
Int. Cl. B65g *59/06*
U.S. Cl. 221—114 1 Claim

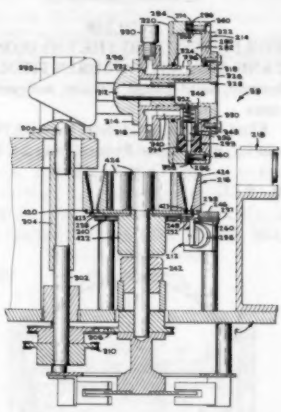
An article vending mechanism includes a frame that supports a front stack of staggered articles, such as beverage cans, and a rear stack of staggered articles in a single vertical column, means pivotally supported by the frame for releasing the lowermost one of the articles in both of said stacks for downward movement, a storage shelf means pivoted on said frame and disposed beneath said releasing means under one of said stacks to receive one of the released articles while permitting the other released article to pass by, and a discharge chute which slopes forwardly and downwardly to a discharge opening, said chute having a pocket beneath the rear end of the rear stack to temporarily receive the rear end of the article dropping therefrom onto the chute so as to disengage it from the front article that has been dropped onto the storage shelf.



3,770,164
SINGULATOR FOR SEEDS OR THE LIKE

Ralo L. Hembree, San Jose, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Apr. 18, 1972, Ser. No. 245,076
Int. Cl. B65g *47/14*
U.S. Cl. 221—211 16 Claims

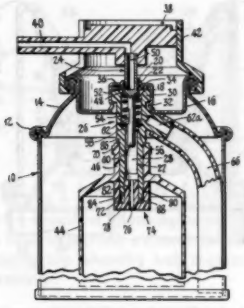


A singulator for small, lightweight articles such as lettuce seeds is disclosed for use in connection with a seed capsule assembly machine. The principle elements of the singulator are a hollow, rotatable drum, having a smooth periphery provided with conical cavities connected by restricted passageways to the drum interior. Means are provided for vacuumizing the drum interior, picking up seeds from the hopper surrounding the exterior of the drum and at the discharge location, the cavities successively are connected to a source of air under pressure discharging the seeds. Two air jets are provided for blowing off duplicate seeds picked up by the cavity so that only a single seed is discharged.

3,770,165
MIXING TYPE LIQUID DISPENSER

Wolf Steiman, Fairfield, and Steven W. Beres, Bridgeport, both of Conn., assignors to VCA Corporation, Greenwich, Conn.

Filed Aug. 12, 1971, Ser. No. 171,262
Int. Cl. B65d *35/22, 83/14*
U.S. Cl. 222—136 6 Claims

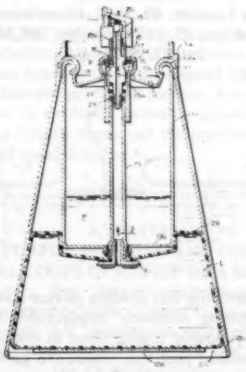


A dispenser comprising a can containing pressurized liquid and having a valve and valve housing therefor at its outlet opening, to control the discharge. Carried by the valve housing and disposed inside the can is a projecting nipple to which there is attached the neck of a collapsible container, the latter having flexible walls and a product therein which is pressurized due to the pressure existing against the flexible container walls. A second valve controls flow through the nipple, and thus the out-flow of product from the container is effected by the pressure against the walls thereof. In this environment the invention embraces extending the nipple within said container past the inner end of the neck thereof, and attaching to said extended or terminal end a hollow or apertured retainer cap which serves to positively maintain the container neck on the nipple against dislodgement therefrom, and to establish a leakproof seal.

3,770,166
SEAL FOR AEROSOL DISPENSER

Jean Marand, Saint-Benoit, France, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 18, 1971, Ser. No. 189,817
Int. Cl. B67d *5/60*
U.S. Cl. 222—145 3 Claims

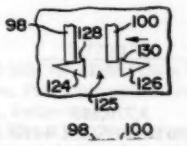


A seal for use in an aerosol type dispenser of the type having an outer product container and a cover thereon with a valve assembly mounted on the cover and a tube through the propellant cartridge into the valve assembly and a flexible product containing bag within the outer container for containing a product to be dispensed. The seal is between the tube and the bottom of the propellant cartridge laterally and the bag and the tube longitudinally. The bottom of the propellant cartridge has a turned down flange around the tube where the tube passes through the bottom of this cartridge, the flange defining a shoulder together with the bottom. An annular gasket is positioned within the flange between the flange and the tube. A bag adapter is provided which is comprised of a hollow stem, an adapter flange on one end of the stem and an annular projection extending outwardly from the end of the stem opposite that on which the adapter flange is positioned. The adapter flange is adhered in a leakproof manner against the inside of the bag and the stem extends out of the bag and into the interior of the tube, the projection being positioned and held slightly inwardly in the direction into the propellant cartridge on the shoulder and bulging the tube outwardly forming a stop to hold said bag adapter in position. The annular gasket is compressed between the bulge and the shoulder forming said seal.

3,770,167
SAFETY CLOSURE

Ronald F. Ewald, Rolling Meadows, Ill., assignor to Seaquist Valve Company, Cary, Ill.

Filed May 18, 1972, Ser. No. 254,389
Int. Cl. B65d *83/14*
U.S. Cl. 222—153 7 Claims

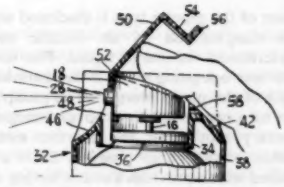


An aerosol valve safety-lock device for an aerosol dispenser including a valve actuating means comprising a button actuator and valve stem having a plurality of locking legs formed thereon to operatively engage corresponding locking ledges formed within the dispenser to prevent vertical movement of the valve actuating means relative to the dispenser when in the "locked" position. The device further includes arming means to move the locking legs out of operative engagement with the locking ledges to permit vertical movement of the valve actuating means relative to the dispenser to actuate the dispenser.

3,770,168
CHILDPROOF ACTUATOR CAP FOR AEROSOL AND LIKE DISPENSING DEVICES

Philip H. Sagarin, Greenwich, Conn., assignor to VCA Corporation, Greenwich, Conn.

Filed Apr. 10, 1972, Ser. No. 242,545
Int. Cl. B65d *83/14*
U.S. Cl. 222—182 8 Claims



This invention provides a childproof actuator cap for small hand-held dispensers of the type wherein a cap body in the

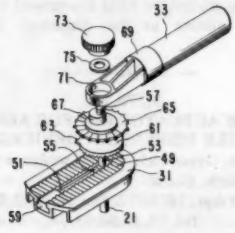
form of an inverted shell has a central bore which slidably carries an actuator button connected with the valve stem or plunger of the dispenser. The cap body has in its rear wall a deep, finger-receivable notch which locates the user's finger in the proper position for depressing the actuator button. A guard piece or cover member is carried by the cap body and overlies the actuator button, thereby to normally shield the same and prevent its actuation. The guard piece is hingedly connected to the front wall of the cap, and is further connected separably to the back wall of the cap by a clasp means which normally is so arranged that an infant or small child cannot readily comprehend the movements necessary to undue the clasp. The entire actuator cap presents generally a closed appearance, such that a person who would operate the dispenser requires knownledge or judgement gained from experience, indicating to him beforehand that the guard piece must be shifted to uncover the actuator button. This knowledge is needed, in addition to any dexterity normally required to separate the clasp. For a person who is properly informed, the operation of the dispenser is relatively simple. Such person merely lifts the back end of the guard piece to unclasp it, whereupon the piece can be swung upward to provide access to the actuator button. The informed user then merely holds the dispenser in the usual manner with the index finger under the raised, hinged guard piece and on the button, and thereafter depresses the latter to discharge the contents. While such operation is seemingly simple, it cannot be readily effected by a small child or infant who lacks the knowledge that first the guard piece must be raised to uncover the actuator button, and second that raising of the guard piece requires an unlatching or opening of a clasp by which the guard piece is secured in place.

3,770,169

MOTORIZED LIQUID DISPENSER WITH AN ACCURATE DISPENSING VOLUME ADJUSTMENT

William J. Roach, Foster City, Calif., assignor to Oxford Laboratories, San Mateo, Calif.

Filed June 14, 1971, Ser. No. 152,961
Int. Cl. G01f *11/06*
U.S. Cl. 222—309 **3 Claims**



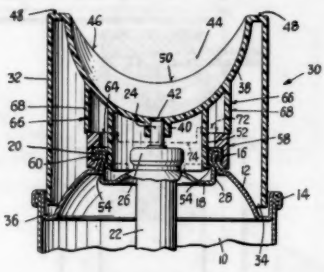
A liquid dispenser of the pipette type is disclosed wherein a pump plunger is reciprocated by an electric motor to discharge a predetermined volume of liquid. The volume of liquid dispensed in one operating cycle is determined by the linear stroke length of the pump plunger. The pump plunger stroke length is in turn controlled by a novel mechanism for converting the rotary motion of the electric motor into reciprocating motion of the pump plunger. Such a motion converter is described which provides a crank having an accurate and controllable separation of two points of rotation wherein an electric motor drive shaft is connected to one of the points and a reciprocating plunger mounting is driven by the other of the points.

3,770,170

CONFINING HAND-HELD DISPENSER CAP

Thomas H. Hayes, Westport, Conn., assignor to VCA Corporation, Greenwich, Conn.

Filed Aug. 28, 1972, Ser. No. 284,429
Int. Cl. B65d *83/14*
U.S. Cl. 222—402.11 **6 Claims**



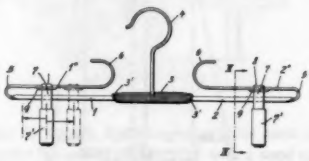
A small hand-held dispenser of the pressurized container type, provided with a jumbo-size confining- type cap arranged with a deep, cup-like depression in which the dispensed product is initially restricted. Such product, discharged in the form of a foam, reacts after discharge to form a cotton-like mass that is initially confined by the cup portion of the cap. The cup-like cap configuration is characterized by two oppositely-disposed deeply cut-away rim portions which give the rim a scallop-like shape whereby not only is there facilitated the removal of the product as a somewhat fluffy mass but in addition there is had the advantageous effect of large venting passages during the initial discharge, while the cap is being pushed inward by the palm of the user's hand. An adapter ring, which can be applied to a conventional pressurized container can, constitutes a locking means. It has a configuration enabling it to be snapped onto the top wall of the can and also to control the cap by permitting restricted turning movement of the latter between end stops. A cooperable locking arrangement on the adapter ring and cap body prevents the latter from being depressed or pushed inward to effect discharge of product after it has been turned to engage one of the end stops. Upon opposite turning to engage the other end stop, the cap can be depressed to effect the discharge.

3,770,171

HOLDING AND STRETCHING DEVICE FOR TROUSERS AND SKIRTS

Ernst Hobi, Alte Landstr. 69, 8942, Oberrieden, Switzerland

Filed Jan. 25, 1971, Ser. No. 109,364
Int. Cl. A47j *51/12*
U.S. Cl. 223—95 **1 Claim**



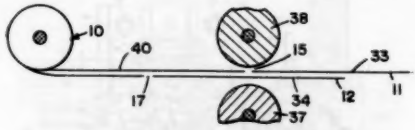
A garment stretching and holding device comprising a pair of laterally adjoining relatively displaceable bars; a spring around the bar yieldably urging them in opposite directions and into an extended position; respective garment engaging forks straddling the bars and shiftable therealong, each of the forks having a respective bight passing over the respective bar and a retaining ring passing around the shanks of the fork immediately beneath the bar and in frictional contact with the underside thereof.

3,770,172

ONE-AT-A-TIME ALTERNATE DISPENSING METHOD

Ernst Daniel Nystrand, and Archie S. Krufger, both of Green Bay, Wis., assignors to Paper Converting Machine Company, Green Bay, Wis.

Filed May 2, 1972, Ser. No. 249,496
Int. Cl. B26f 3/02
U.S. Cl. 225—2 2 Claims



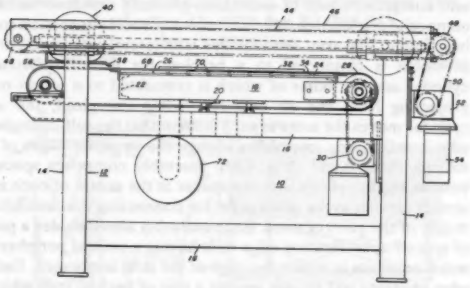
A web roll having a pair of plies equipped with transverse perforations of a specified character which are off-set in the different plies so as to provide a source for dispensing through a force-developing nip whereby web segments issue sequentially and alternately.

3,770,173

APPARATUS FOR AUTOMATICALLY BREAKING OUT A SCORED GLASS BRACKET

David B. Carothers, Ellwood City; Edward W. Rearick, Gibsonia, and Lemuel R. McBride, Zelienople, all of Pa., assignors to Billco Manufacturing, Inc., Zelienople, Pa.

Filed Sept. 11, 1972, Ser. No. 287,972
Int. Cl. C03b 33/04
U.S. Cl. 225—2 14 Claims



An apparatus for breaking out a prescored glass pattern from a glass bracket or plate which includes means for supporting the glass bracket upon an aligned template which is slightly larger than the prescored pattern. A weighted, pliable, elongated roller is rotatably movable across the supported glass bracket to cleanly break out the prescored pattern with very straight and smooth edges.

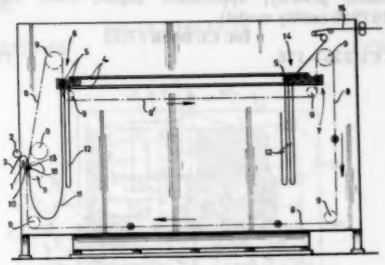
3,770,174

APPARATUS FOR FORMING AND CONVEYING VERTICAL LOOPS IN A STRIP OF A MATERIAL

Wolfgang Koster, Bad Salzuflen-Schoetner, and Harald Jentzsch, Brackwede-Quelle, both of Germany, assignors to Stork Amsterdam N.V., Amstelveen, Netherlands

Filed Mar. 28, 1972, Ser. No. 238,871
Int. Cl. B65h 17/00
U.S. Cl. 226—107 3 Claims

An endless conveyor for a festoon steamer, said conveyor serving for the movement of support rods for vertically hanging loops of a textile web, in which a portion of the path of the conveyor consists of a horizontal track; the extremities of the supporting rods are carried in support members from the conveyor and are deposited on the beginning of this track. The same rods are picked up again at the end of the track by said conveyor; The support members each contain two movable bolts for locking the supporting rods. A double cam at both ends of the track serves for actuating the locking bolts independently of each other.

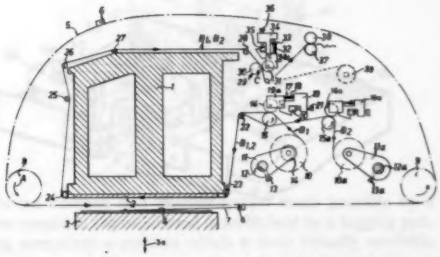


3,770,175

STRIP FEED MECHANISM FOR A PLATEN PRESS

Roger Lale-Demoz, Pully, Switzerland, assignor to J. Bobst & Fils S.A., Prilly, Switzerland

Filed Mar. 23, 1971, Ser. No. 127,176
Claims priority, application Switzerland, Mar. 26, 1970, 4673/70
Int. Cl. B65h 17/42
U.S. Cl. 226—110 10 Claims



A strip of material such as a metalized band is conveyed to an operating station between platens of a platen press by a strip feed mechanism comprising a coil carrier means which supports at least one reel of strip material for unwinding, an unwinding and feed means which may be synchronized with the platens and operable with variable feed lengths or feed speeds to intermittently unroll predetermined amounts of strip material, a guide means to define a path of movement of the unwound strip of material between the platens and in a generally C-shaped path to a tensioning means which applies a continuous tensioning force to the strip material along its path of travel.

3,770,176

MAGNETIC TAPE RECORDING AND/OR REPRODUCING APPARATUS WITH AN AUTOMATIC START DEVICE

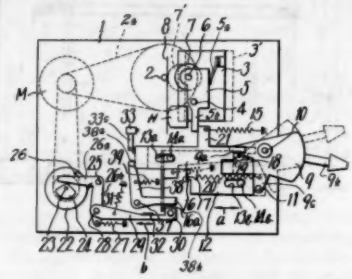
Hisashi Hanzawa, and Juho Yoneya, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 16, 1972, Ser. No. 307,134

Claims priority, application Japan, Nov. 18, 1971, 46/107910 (utility model)

Int. Cl. B65h 17/22

U.S. Cl. 226—176 11 Claims



An apparatus for recording and/or reproducing signals on a magnetic tape is provided with an automatic start device which includes a stop assembly capable of being set for temporarily halting operation of the tape drive, for example, by moving the pinch roller away from the capstan which is rotated by an electric motor upon energization of the latter, a timer for causing energization of the motor at a predetermined time, and a release assembly operated in response to energization of the motor for releasing the stop assembly and permitting operation of the tape drive.

3,770,177

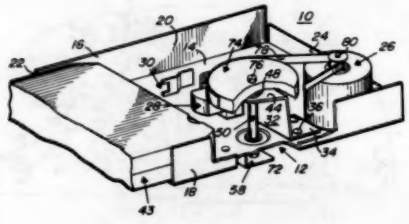
CAPSTAN HOUSING ASSEMBLY FOR A CARTRIDGE TAPE PLAYER

Donald J. Dattilo, Mt. Prospect, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Dec. 11, 1972, Ser. No. 313,889

Int. Cl. B65h 17/20

U.S. Cl. 226—194 6 Claims



A sheet metal capstan housing for mounting a capstan drive shaft on the tape deck of a cartridge tape player includes a substantially Z-shaped support bracket having a first leg fastened to the base wall of the tape deck in parallel relation therewith. The opposite leg of the bracket includes a first toroidal bearing mounted therein for receipt of a capstan drive shaft extending substantially perpendicular to the base wall of the tape deck. A second toroidal bearing aligned with the first bearing is provided in the base wall to receive the capstan shaft also, and a capstan stop member is attached to the base wall on the surface thereof opposite the surface on which the support bracket is mounted. The stop member engages the end of the capstan shaft inserted through the bearings to position the shaft correctly in the support bracket.

3,770,178

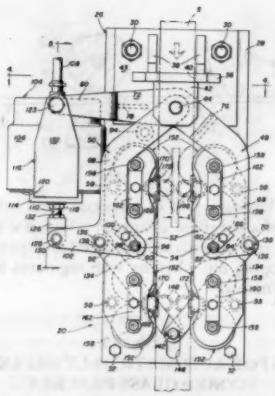
STRIP EDGE CONDITIONER

Emmerich I. Olah, Phoenix, Ariz., assignor to Interlake, Inc., Chicago, Ill.

Filed Sept. 17, 1971, Ser. No. 181,302

Int. Cl. B65h 23/04

U.S. Cl. 226—198 18 Claims



The self-centering edge conditioning unit for a moving sheet metal strip is an element placed in a strip conditioning line to assist in removing non-uniform terminal residual stresses which may be produced therein and which may actually result in physical deformation of the strip, such lateral curvature sometimes being known as "chamber." The edge conditioning unit comprises a pair of assemblies pivotally mounted on two composite arms which have a common pivotal connection to a base frame. The arms are provided with lateral extensions, one of which is connected to a bracket for mounting an air cylinder and the other of which is connected to a piston rod projecting from the air cylinder. When energized, the air cylinder moves the arms in such fashion that the self-centering edge conditioning assemblies engage the opposite edges of a moving sheet metal strip. Each assembly comprises spaced bottom and top plates with the spacer at the center of each assembly serving as the pivot point for connecting that assembly to one of the pairs of arms. Each assembly also includes a pair of spaced-apart floating edge rolls having a central peripheral notch or recess in which the edge of the strip is engaged. Each edge engaging roll rotates against a pair of backup rolls which are pivotally mounted upon and between the top and bottom plates. The edge engaging rolls do not have a fixed center of rotation and are prevented from falling free of the assembly by a pair of pins which may be engaged by the periphery of the strip edge engaging roll when no strip is placed or passing between the assemblies.

3,770,179

SELF-PRESSURIZING SEAL FOR ROTARY SHAFTS

James Dennis McHugh, Santa Clara, Calif., assignor to General Electric Company, Schenectady, N.Y.

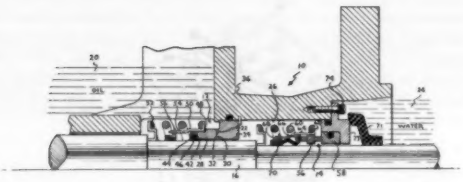
Filed Apr. 8, 1971, Ser. No. 132,485

Int. Cl. F16j 9/00, 15/38

U.S. Cl. 277—2 8 Claims

A self-pressurizing shaft seal for an oil filled submersible motor is characterized by an inboard spiral grooved face seal and an outboard conventional face seal disposed in series relationship along the motor shaft. During operation, the inboard spiral grooved face seal pumps oil from the motor interior into a substantially confined zone between the seals to increase the oil pressure at the outboard face seal without the necessity for

structurally strengthening the entire motor housing. Also disclosed is the disposition of a shoulder on the spiral grooved seal runner face remote from the pumping interface to permit the oil pressure within the confined zone to hydraulicly increase the axial force upon the runner thereby increasing the pumping pressure of the spiral grooved seal in boot strap



fashion. Other disclosed seals contain means for measuring the pressure within the confined zone to actuate remote signaling devices upon a failure of the outboard seal as well as spiral grooved face seals having valving means to alter the pumping rate of the inboard seal upon a loss of pressure in the confined zone between seals.

3,770,180

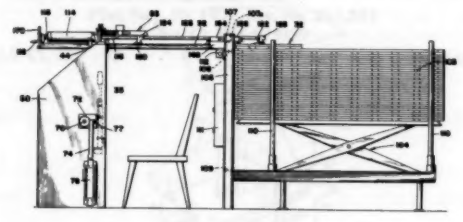
APPARATUS FOR MANUFACTURING BOX SPRINGS

Walter Stumpf, Munster, Ind., assignor to Simmons Company, New York, N.Y.

Division of Ser. No. 829,533, June 2, 1969, abandoned. This application Jan. 18, 1972, Ser. No. 218,843

Int. Cl. B27f 7/14

U.S. Cl. 227—48 **7 Claims**



An apparatus for assembling box spring "constructions" by stapling rows of springs to a base frame. The apparatus utilizes a wire spring coil in which the wire at one end of the coil is bent to cross the bottom convolution so that a stapling gun inserted axially into the spring from the other end will secure the spring to the frame with one staple. The staple is driven with enough force to impress the cross-wire into the surface of the frame.

The apparatus handles the springs and frames upside down, the guns being lowered for loading with springs, and raised for firing. The gun muzzles are adapted to receive an inverted spring and to position it rotatively so that the staple when driven will encircle the cross-wire from which the spring is suspended on the gun.

After each firing, the frame indexes for another row, and is followed at a controlled interval by a second frame brought into the mechanism automatically from a magazine.

3,770,181

SEALING RING FOR SLIDE-RING SEALS

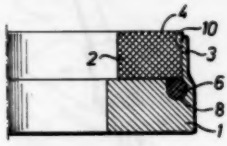
Filip Torvald Stahl, Alvsjo, Sweden, assignor to Stenberg-Flygt AB, Solna, Sweden

Filed Dec. 7, 1971, Ser. No. 205,676

Claims priority, application Sweden, Dec. 30, 1970, 17815/70

Int. Cl. F16j 15/34

U.S. Cl. 277—96 **5 Claims**



Sealing ring for slide-ring seals, composed of a hard material ring and a supporting ring, the supporting ring and the hard material ring having an essentially radial surface of contact with one another, the supporting ring and the hard material ring being held together by means of a resilient collar or sleeve at the supporting ring, which sleeve is rolled or pressue-turned against the hard material ring and thus holds it to the supporting ring.

3,770,182

ANIMAL MARKING APPARATUS AND METHOD

Robert L. Propst, and Howard B. Propst, both of Ann Arbor, Mich., assignors to Herman Miller Research Corporation, Ann Arbor, Mich.

Division of Ser. No. 159,784, July 6, 1971, which is a continuation-in-part of Ser. No. 12,056, Feb. 17, 1970, abandoned. This application Aug. 10, 1972, Ser. No. 279,627

Int. Cl. B25c 5/10

U.S. Cl. 227—146 **23 Claims**

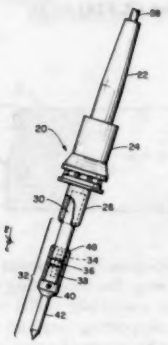
A record keeping and tagging system made possible by a machine readable tag implanted in an animal by a tagging gun. The tag comprises a portion which is both visually readable and machine readable, and a portion which includes barbs or spring-biased tines which lock it to the animal. The tagging gun comprises cocking means for moving the tag-like article into a firing position, releasing means for releasing the article from the cocking means, means for firing the article, and triggering means for activating the cocking means and releasing means in sequence by applying a force in a single direction. An information retrieval station features a chute with compressible sides and a weighing and measuring platform, and a machine reader which is automatically positioned with respect to the tag when the animal triggers a photoelectric sensing device, so as to read out the information coded therein while the animal is weighed and/or measured. A computer can be utilized to compare the animal's weight and measurement determined so as to further direct the processing of the animal.

3,770,183

HEAT CONTROL FOR HEATED TOOL

Louis Vanyi, 246 Crestwood Avenue, Ventura, Calif.

Filed May 24, 1972, Ser. No. 256,494
Int. Cl. B23k *3/04*
U.S. Cl. 228—53 **8 Claims**



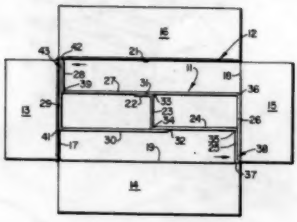
A heat flow control system for a heated tool whereby the work engaging tip of the tool is maintained at low temperature during standby perids to retard tip corrosion but can be almost instantaneously raised to a high working temperature when needed.

3,770,184

INTERNAL PARTITIONING OF COMPARTMENTED CASES

Winston G. Rockefeller, Woodcliffe Lake, N.J., assignor to Colgate-Palmolive, Company, New York, N.Y.

Filed Nov. 19, 1971, Ser. No. 200,439
Int. Cl. B65d *5/48*
U.S. Cl. 229—15 **11 Claims**



A compartment defining member for insertion into a rectangular shipping case is a single length blank of fibreboard or the like folded on parallel score lines with end panels fixed to intermediate panels, and the arrangement being such that the inherent tendency of the folded panels to return to the unfolded condition of the blank increases the stability and resistance to deformation of the inserted member in the case.

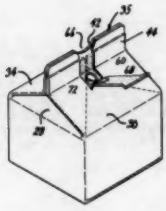
3,770,185

BEVERAGE CONTAINER WITH STRAW HOLE

Allan C. Reeves, Lafayette, Calif., assignor to Foremost-McKesson, Inc., San Francisco, Calif.

Filed Feb. 26, 1971, Ser. No. 119,111
Int. Cl. B65d *5/72*
U.S. Cl. 229—17 G **10 Claims**

A unitary folded beverage container having a peak or gable top and a tear strip to provide a strawhole. The tear strip is formed by spaced apart score lines on an outer side of a top gable forming wall and the strawhole is formed by a closed score line formed on an inner side of the same wall, at a position beneath and between the outer spaced apart score lines. The score lines are cut to a substantial overlapping depth (viz., 40 to 75 percent of the wall thickness) from opposite sides of the gable forming wall. Upon pulling the tear strip, a layer of material between the spaced apart score lines separates from the gable wall together with the entire thickness of the wall contained within the inner closed score line. With regard to manufacture, the means to form the strawhole is easily incorporated into the container blank without necessitating any change in the overall manufacturing process.

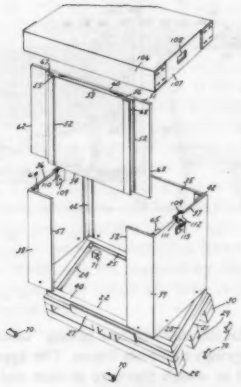


3,770,186

COLLAPSIBLE SHIPPING CONTAINER

Julius B. Kupersmit, 145-80 228th St., Springfield Gardens, Manhattan, N.Y.

Filed July 7, 1972, Ser. No. 269,847
Int. Cl. B65d *5/00, 5/36, 5/44*
U.S. Cl. 229—23 R **4 Claims**

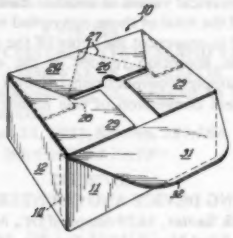


An improved collapsible shipping container of the type in which a plurality of side walls are detachably interconnected to a rigid base or pallet. Means is provided for rigidifying the side walls against vertical compressive forces accompanying normal stacking operations. Improved clip and cleat means for interconnecting the walls to the pallet permits more rapid assembly, with greater resistance to pilferage. An improved sealing means interconnects the lid of the container to the side walls thereof in a manner permitting the use of a conventional seal. An improved side door construction affords greater rigidity to the container, and more effectively resists inwardly directed forces against the outer surface of the door.

3,770,187
CONTAINER CLOSURE STRUCTURE

Tony D. Faires, Chattanooga, Tenn., and Larry M. Balkin, Decatur, Ga.

Filed Apr. 12, 1972, Ser. No. 243,247
Int. Cl. B65d 5/10
U.S. Cl. 229—39 R 1 Claim

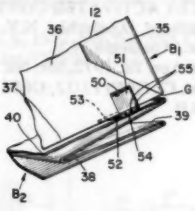


A closure structure for a container formed from a cut and scored blank of paperboard comprising opposed pairs of main and side panels hingedly connected to form a tube including a first closure flap connected along a line of fold of one of the main panels and having V-shaped panels therein defined by score lines commencing near the line of fold and diverging toward the distal edge thereof. Intermediate closure flaps are each joined along a fold line to a correlative side panel, and are foldable into position overlapping the first closure flap, and a fourth closure flap is connected along a line of fold to the other of the main panels and is likewise foldable into closing position, the fourth closure flap having converging sides and having a distal portion adapted to enter beneath the V-shaped panel of the first closure flap.

3,770,188
INTERLINKED PACKAGING BAGS

Richard R. Norman, Palos Verdes Peninsula, Calif., assignor to Tony J. Bressickello, Gardena, Calif.

Filed Nov. 30, 1971, Ser. No. 203,201
Int. Cl. B65d 33/00
U.S. Cl. 229—53 7 Claims



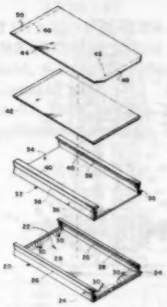
A group of serially aligned, open ended paper bags are arranged so that the bags can be dispensed to a location for packaging articles such as groceries and then sequentially detached from the group one at a time.

3,770,189
SHIPPING BAG

Donald V. Long; Norwin Cedric Derby, and Peter P. Chorak, all of Dallas, Tex., assignors to The Dalpak Corporation, Dallas, Tex.

Filed Oct. 1, 1971, Ser. No. 185,708
Int. Cl. B65d 31/00
U.S. Cl. 229—53 9 Claims

A shipping bag for mattresses and similar articles is formed from a two-ply tube including front and back walls and side walls comprising inwardly projecting gusset folds. The outer ply of the front wall extends beyond the remaining plies to form endwise projecting lips. One of the lips is folded over the corresponding ends of the side walls and the back wall and is secured to the outer ply of the back wall to form a closed end. The corners of the front and back walls at the closed end are then folded inwardly and are secured in the gusset folds of the side walls.

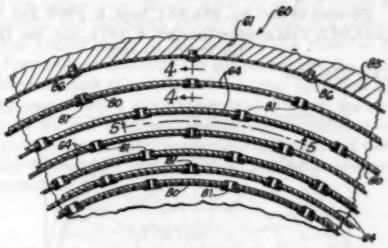


Upon completion of the foregoing steps, an article is inserted into the bag. The ends of the side walls and the back wall at the open end of the bag are then folded inwardly and the lip at the open end is secured to the outer ply of the back wall to close the bag. In a second embodiment of the invention, threads are secured in the corners of the outer ply of the bag to prevent tearing.

3,770,190
CENTRIFUGAL COUNTERCURRENT SEPARATOR HAVING BANDS COVERED WITH FLUOROCARBON SHEETS

Collin M. Doyle, and Wladzia G. Podbielniak Doyle, both of 21 West Elm Street, Chicago, Ill.

Filed Feb. 25, 1971, Ser. No. 118,806
Int. Cl. B04b 15/02
U.S. Cl. 233—15 2 Claims



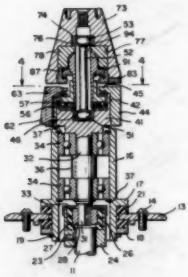
A device which may be a centrifugal countercurrent exchange extractor and/or a centrifugal separator, has a cylindrical rotor within which are mounted concentric, radially spaced, cylindrical, apertured bands. The inwardly facing surface of each band is covered with an apertured fluorocarbon sheet such that the apertures in the sheets are respectively aligned with the apertures in the bands. Rivets pass through the aligned apertures and are deformed to hold the sheets securely against the bands. Orifices are provided either in rivets or through the bands and sheets for the countercurrent flow of liquids.

3,770,191

MEANS FOR STABILIZING HIGH SPEED ROTORS

Josef Blum, Norwalk, Conn., assignor to Ivan Sorvall Inc., Newtown, Conn.

Filed June 28, 1971, Ser. No. 157,174
Int. Cl. B04b *9/14*
U.S. Cl. 233—23 A **31 Claims**



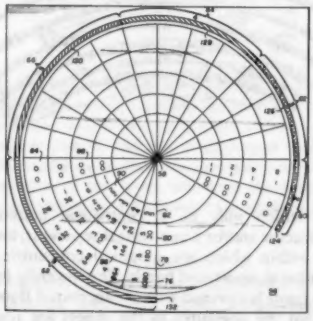
A compound articulated drive system for a centrifuge which prevents vibration of the centrifuge rotor during critical speeds of acceleration and de-celeration. Means are provided for automatically causing the center of gravity of the rotor to become aligned with the axial center of the drive system, maintaining that alignment, and eliminating vibration of the drive system and especially of the spinning rotor within critical ranges of speed during deceleration of the centrifuge. The foregoing is accomplished by the provision of a self-centering assembly comprising a separate rotor shaft pivotally articulated upon the centrifuge drive system shaft and by means of a captive slide block integrated with said assembly and movable on the drive shaft. During acceleration, the centering assembly automatically relocates itself and becomes aligned with respect to the dynamic axis of the rotor and remains fixed substantially in said dynamically aligned position throughout the centrifuging process and through deceleration until the rotor comes to a stop.

3,770,192

GAME UTILIZING MATHEMATICAL BASE SYSTEMS

Ronald J. Tallarida, Willingboro, N.J., assignor to University Creations, Inc., Cherry Hill, N.J.

Division of Ser. No. 856,061, Sept. 8, 1969, Pat. No. 3,618,952. This application Oct. 4, 1971, Ser. No. 186,551
Int. Cl. G06c *3/00*
U.S. Cl. 235—88 **5 Claims**



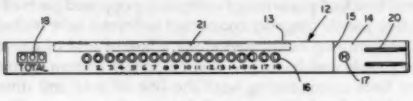
A game is disclosed having at least one playing board having an array of uniquely identifiable positions thereon with such positions having numerical value associated therewith. A position selection system is provided for sequentially identifying a plurality of said positions on the board and the numerical values associated therewith. When a preselected number of positions have been identified, further identification ceases; and a base selection card is chosen for selecting the particular mathematical base system on which continued play of the game is to be predicated. Once the base system is chosen, those identified numerical values which have mathematical significance in the particular base system chosen are converted to numerical values in another base system, preferably base ten, and the total of those converted numerical values are accumulated to represent the score of the player. A particular aspect of the invention resides in the disc-type converter which is of simple, compact construction and so designed to facilitate direct conversion of one numerical base system to another.

3,770,193

SCORING DEVICE AND COUNTER THEREFOR

Charles Frank Sauter, 1620 Shepard Dr., Maple Glen, Pa.

Filed May 8, 1972, Ser. No. 251,319
Int. Cl. G06c *27/00*
U.S. Cl. 235—117 R **11 Claims**



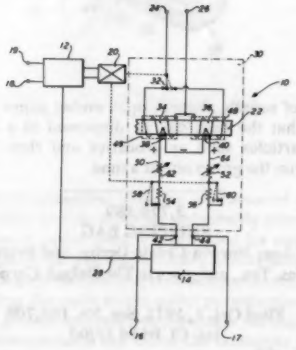
A scoring device is provided, that is adapted for use with the game of golf, as well as for other uses, and which is provided with means for individually indicating the score attained in each hole played, as well as for continuously indicating the total score attained throughout the game. The device is also adapted for indicating the particular hole being played at any time. That portion of the device which maintains a running total score throughout the game comprises a counter also of unique construction, and adapted for a multitude of other uses. The scoring device is generally of tubular construction, having members rotatable relative to each other, for driving the various mechanisms which set the scores.

3,770,194

THERMALLY ACTIVATED CONTROL SYSTEM

William E. Engelhard, Apalachin, N.Y., assignor to Owego Heat Treat, Inc., Apalachin, N.Y.

Filed Apr. 28, 1972, Ser. No. 248,374
Int. Cl. G05b *11/32*; G05d *29/30*
U.S. Cl. 236—15 B **5 Claims**



A furnace temperature control system including auxiliary signal generating means, the output of which is connected in

parallel with the error signal derived from the furnace temperature sensor, the totality of said signals serving to activate and inactivate power feed for the furnace. The auxiliary signal is so generated and so tied to the switching means for furnace power that the combined error and auxiliary signals inactivate and activate power feed to the furnace at temperatures decreasingly displaced from a desired preset temperature, whereby to enable more rapid attainment of the desired equilibrium temperature.

3,770,195

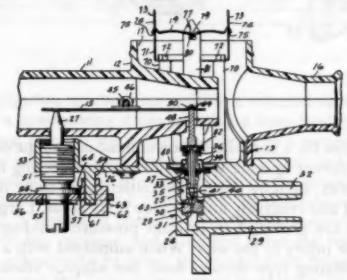
TEMPERATURE CONTROL SYSTEM AND VACUUM MODULATOR VALVE THEREFOR

Rudolph J. Franz, Schaumburg, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed Mar. 24, 1972, Ser. No. 237,766

Int. Cl. G05d *23/13*

U.S. Cl. 236—13 **18 Claims**



Automatic vacuum controlled air conditioner control, for regulating the temperature of the passenger compartment of an automotive vehicle in accordance with ambient and in-car air temperatures in which the vacuum controls of the system is balanced commensurate with the vacuum required to position the controls for preselected temperature requirements.

3,770,196

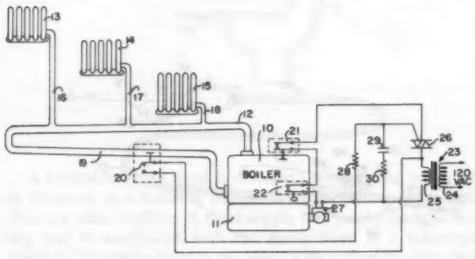
CONTROL CIRCUIT FOR A HEATING SYSTEM

William J. Griffith, 2815 W. Briarwood, Arlington Heights, and James Richard DePaepe, 19 W. 427 Thorndale, Itaska, both of Ill.

Filed Nov. 6, 1972, Ser. No. 303,777

Int. Cl. F24d *1/02*

U.S. Cl. 237—9 R **18 Claims**



A solid-state control circuit for a steam heating system of the type wherein a steam boiler is fired when the condensate returned to the boiler reaches a predetermined minimum temperature, and is shut down when the steam pressure developed in the boiler reaches a predetermined maximum level or when the water level in the boiler falls below a predetermined minimum level. Provision is made for preventing premature shut-down of the boiler from momentary low water conditions, and for positively shutting down the system under conditions of excessive steam pressure. The circuit utilizes a minimum number of components, and provides improved reliability and safety over prior-art relay-type circuits. A preferred mounting arrangement for the principal components of the circuit is also shown.

3,770,197

ARRANGEMENT IN A HOT WATER-CIRCULATING HEATING SYSTEM

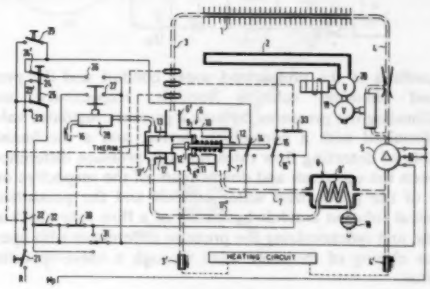
Hans Meier, Remscheid, Germany, assignor to Joh. Vaillant KG, Remscheid, Germany

Filed Apr. 17, 1972, Ser. No. 244,824

Claims priority, application Germany, Apr. 22, 1971, P 21 19 622.5

Int. Cl. F24d *3/08*

U.S. Cl. 237—8 C **8 Claims**



A gas burner heats water to be forced through radiators by a pump. A valve assembly on the forward or feed conduit has a connection going to the radiators and a connection going through a by-pass to the return conduit. In the by-pass conduit is a heat exchanger for heating water to be consumed. A temperature sensor on the assembly is exposed to and responsive to the unheated water to be consumed and the heated water in the forward conduit. This temperature sensor operates an electrical switch and, through a lost motion connection, operates the water flow valve in the valve assembly. When this sensor is cool the valve is set to cause the water in the forward conduit to flow through the by-pass and the electrical switch is closed. As the temperature sensor heats up its first opens the electrical switch and thereafter moves the valve to a position at which the heated water in the forward line flows to the radiators. For summer operation the gas burner and the pump are controlled through that switch. For winter operation that switch is by-passed and a room thermostat controls the electric supply to the gas valve and pump. Also included in the electrical circuits are switches responsive to the flow of water to be heated through the heat exchanger and water temperature limit switches.

3,770,198

METHOD AND APPARATUS FOR DILUTING AND MIXING CHEMICAL SOLUTION FOR AGRICULTURE

Kazuyasu Mihara, Nihama, Japan, assignor to Sumitomo Chemical Company, Limited, Osaka; Topico Ltd., Kanagawa-ken, both of Japan

Filed Mar. 24, 1972, Ser. No. 237,802

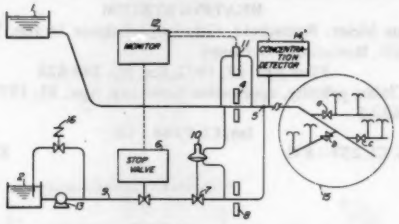
Claims priority, application Japan, Mar. 29, 1971, 46/22806

Int. Cl. G05d *7/00*

U.S. Cl. 239—10 **8 Claims**

A chemical solution such as farm chemicals, pesticides or liquid fertilizers is injected and mixed under pressure at a predetermined rate into pressurized water and automatically controlled when spraying of the diluted and mixed chemical

solution is discontinued or restarted, by means of an apparatus comprising a pressurized water conduit provided with an orifice and a connecting part successively in a water flow passage, a forward end of the water conduit being connected to a spraying means, a pressurized chemical solution conduit provided with a stop valve, a pressure regulator valve and an orifice successively in a solution conduit, a forward end of the solution conduit being connected with the connecting part of the pressurized water conduit, a pressure regulator mechanism capable of detecting pressures at upstream sides of



the orifices of the pressurized water conduit and the pressurized chemical solution conduit, respectively, and equilibrating the pressures through a pressure regulator valve synchronized with a controlling device, and a mechanism capable of detecting flow rates through pressure differences between the upstream and downstream of the respective orifices of the pressurized water conduit and the pressurized chemical solution conduit by means of a flow rate checking means, and synchronizing the pressure differences with opening or closing of the stop valve through a valve-operating monitor.

3,770,199

DEVICE FOR THE CONTROLLED EMISSION OF VAPOURS

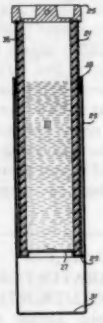
Serge Hoek, and Wilhelm Buhren, both of Amsterdam, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 13, 1971, Ser. No. 180,028

Claims priority, application Netherlands, Sept. 30, 1970, 7014338

Int. Cl. A61l 9/04

U.S. Cl. 239—54 **2 Claims**



A device for the controlled emission of vapors comprising an inner tubular or box-shaped member which contains a volatile active substance and is permeable to vapor. The inner member is telescopingly arranged in a second tubular or box-shaped outer member so that the inner member may be entirely or partially sealed by the outer member. The inner member contains a porous container which may be filled with the active substance and the maximum pore width of which is 30 microns. The container is preferably made of polyethylene. The inner member may either be apertured or be made of a porous material.

3,770,200

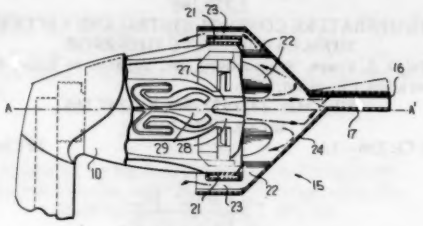
PERSONAL SPRAY AND MASSAGE APPARATUS

Peter Bauer, Germantown, and Vincent F. Neradka, Rockville, both of Md., assignors to Bowles Fluidics Corporation, Silver Spring, Md.

Filed July 24, 1972, Ser. No. 274,519

Int. Cl. B05b 3/14, 7/02

U.S. Cl. 239—102 **24 Claims**



An adapter for a hand-held shower head is configured in the form of a funnel to issue water through a projecting narrow-necked outlet, thereby permitting outlet spray to be directed at recessed and relatively unaccessibe body areas. Large overflow vents are provided to prevent pressure build-up which could cause injury to the user. When employed with a pulsating or oscillating type shower head the adapter vibrates and serves as a combined cleansing and massage unit. The projecting outlet may be proportioned to permit the adapter to serve as a douching apparatus. In another embodiment multiple small outlet fingers project from the adapter to define a water-issuing brush which serves both cleansing and massaging functions. The adapter and spray member may be constructed as an integral unit.

3,770,201

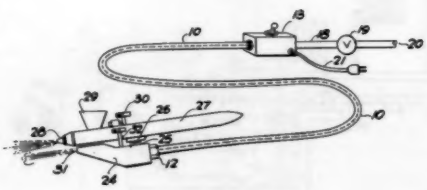
AIR HEATING DEVICE FOR ARTISTS AIR BRUSH

Ralph Sanders, 615 Park Rd., Pittsburgh, Pa.

Filed May 25, 1972, Ser. No. 256,902

Int. Cl. B05b 1/24

U.S. Cl. 239—135 **2 Claims**

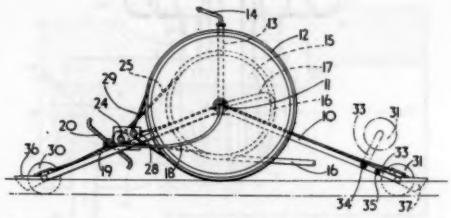


An air heating device provides a flexible tubular communicating channel for compressed air from a suitable source to an artist's air brush. A flexible heating element is disposed within the flexible tubular channel. The channel provides heated air for the artist's air brush and includes a separate valve controlled nozzle for directing heated air separately of the air brush.

3,770,202
TRAVELLING IRRIGATION MACHINE

Alan Ivemy, Ringwood; Theo Sherwen, Chippenham, and Tony Pentelow, Kettering, all of England, assignors to Wright Rain Limited, Ringwood, Hampshire, England

Filed Dec. 21, 1972, Ser. No. 317,292
Claims priority, application Great Britain, Dec. 23, 1971, 60,029/71
Int. Cl. B05b 3/18
U.S. Cl. 239—184 10 Claims

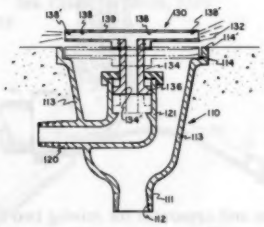


An irrigation machine comprising a wheeled carriage supporting a hose-storing drum carrying a hose having one end connected through the axle of the drum to a spraying device mounted on the carriage and having at its other end a connection for attachment to a hydrant, whereby the spraying device is continuously supplied with water during operation of the machine, a reversible first drive for driving ground-engaging wheels of the carriage and a second drive for rotating the drum in a hose-winding sense, the second drive being over-ridden to permit the drum to be turned in an opposite direction by the pull of the hose as it unwinds when the wheels are driven away from the hydrant.

3,770,203
SPRAY SYSTEM

Dillard F. Dyar, Rt. 2, Abbeville, S.C.

Filed May 26, 1971, Ser. No. 146,954
Int. Cl. B05b 3/06
U.S. Cl. 239—205 12 Claims

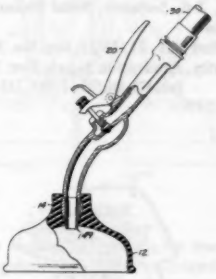


A rotatable spray head is disclosed wherein the spray head is received in a housing designed for mounting flush with a floor or other surface. A fluid supply line passes into the housing and is associated with the spray head in a telescoping fashion. The spray head is provided with a plurality of radially, outwardly extending fluid passageways, the outer ends of which are angularly varied so as to permit fluid to pass therethrough, cause the head to rotate and permit fluid to exit at different angles for complete coverage of an area being sprayed. The spray plate also serves as a cover for the receptacle and moves upwardly therefrom to a spray position when fluid pressure is applied to the underside thereof. In this regard, once the fluid pressure ceases, the spray head automatically returns to an inoperative position where it serves as a cover for the housing. Plate return to the inoperative position may be by gravity, by bias of a spring provided therefor or the like. A preferred embodiment of the present invention finds the housing also serving as a fluid drain and adapted to be connected to a drain line. In this embodiment, the spray plate is provided with a plurality of openings therein in direct communication with the drain so as to permit fluid that has been sprayed or otherwise deposited in the area to flow through the openings in the spray plate into the drain line.

3,770,204
CLEANING AND REMOVAL DEVICE

Frank Schuster, 16315 Gabarda Rd. Rancho Bernardo, San Diego, Calif.

Filed Dec. 27, 1971, Ser. No. 211,989
Int. Cl. B05b 1/28
U.S. Cl. 239—288.5 3 Claims

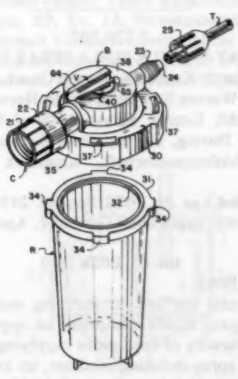


This is a device for cleaning and removal of contaminants from various areas in which cleaning is accomplished by a jet of liquid properly contained to avoid splashing and to concentrate the cleaning effect and removal effect, in which a rubber cup is used to contain and assist in cleaning and removal without contamination of adjoining areas.

3,770,205
SPRAYER WITH DETERGENT OR CHEMICAL ADDITIVE FEED

Denver L. Proctor, Wheat Ridge, and Rudy R. Proctor, Arvada, both of Colo., assignors to Jet-X Corporation, Denver, Colo.

Filed Aug. 24, 1972, Ser. No. 283,491
Int. Cl. B05b 7/28
U.S. Cl. 239—317 11 Claims



A sprayer connectable to a hose and including a body having a compound four-position valve controlling a primary

passageway and two sets of auxiliary passageways. An antisiphon device attached to the body connects the hose to the primary passageway, while an extension tube, also attached to the body, forms a continuation of the primary passageway and terminates in a spray nozzle. The auxiliary passageways, shunting the primary passageway, include a common reservoir mounted on the underside of the body for containing either a liquid soap or detergent or pellets of a soluble chemical, such as a pesticide or plant food additive compound. The valve, operable by a finger lever, may be shifted from an "off" position where the main passageway is closed, to a "rinse" position where only the primary passageway is open, to a "liquid" position where both the primary and a first set of auxiliary passageways are open, and to a "pellet" position where both the primary and the second set of auxiliary passageways are open.

3,770,206

SINGLE HAND OPERATED SPRAYER

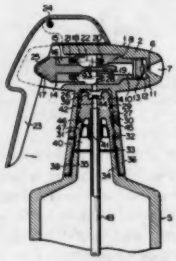
Tetsuya Tada, 2-6, 3-chome, Nishi Nakanobu, Shinagawaku, Tokyo, Japan

Filed Nov. 21, 1972, Ser. No. 308,523

Claims priority, application Japan, Dec. 7, 1971, 46/98863

Int. Cl. B05b *11/00, 1/34*

U.S. Cl. 239—349 **9 Claims**



A single hand operated sprayer comprising a body including a neck touched by the palm of a user's hand and a head provided with a hollow cylinder, said cylinder being fitted with a nozzle at that end which faces the user; and a lever gripped by the user's fingers to cause a piston to slide through the cylinder wherein, when the lever is pulled toward the user the liquid contained in the sprayer is ejected from the nozzle toward the user.

3,770,207

SPRAY NOZZLE FOR A SPRAY DRYER

Fritz Muller, Hurth-Knapsack; Rovert Queck, Hurth-Burback; Josef Koch; Werner Kowalski, Hurth-Hermulheim; Werner Nolden, Bruhl; Gunter Selbst, both of Hurth-Knapsack, and Helmut During, Hurth, all of Germany, assignors to Knapsack Aktiengesellschaft, Knapsack near Cologne, Germany

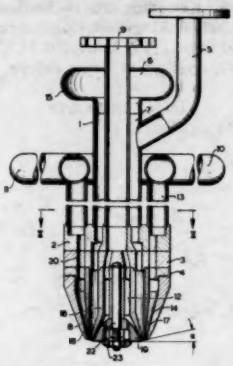
Filed Apr. 26, 1972, Ser. No. 247,814

Claims priority, application Germany, Apr. 29, 1971, P 21 21 066.2

Int. Cl. B05b *7/00*

U.S. Cl. 239—397.5 **7 Claims**

A spray nozzle for use in carrying out a spray-drying process. The spray nozzle comprises an upper part, which is fitted with a plurality of feed pipes supplying a solution to be sprayed and a spray-inducing medium, an axial conpensator, and a base plate, which is made up of rigid but elastic material and connected to two of the said feed pipes and to the axial compensator. The nozzle further comprises an intermediate plate and a nozzle head. The nozzle head has a plurality of passageway-defining rings therein and is secured to the intermediate plate by means of a fastener, and the base plate and intermediate plate are detachably secured together.



3,770,208

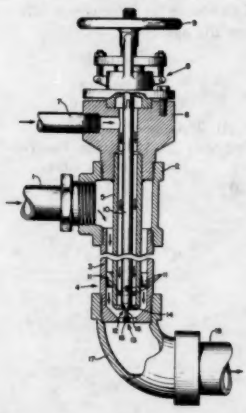
MIXING NOZZLE

Gunter H. Mueller, Cambridge (Galt), Ontario, Canada, assignor to Ethyl Corporation of Canada Limited, Toronto, Canada

Filed Nov. 23, 1970, Ser. No. 92,187

Int. Cl. B05b *7/00*

U.S. Cl. 239—417.3 **5 Claims**



A process and apparatus for mixing two liquid streams by locating a variable area nozzle for one stream inside the noxxle for another stream and deflecting the stream from the inside nozzle in a spray pattern into the throat of the outside nozzle.

3,770,209

ASPIRATING SPRAY HEAD

Richard L. Wilcox, Adel, Iowa, assignor to Delavan Manufacturing Company, West Des Moines, Iowa

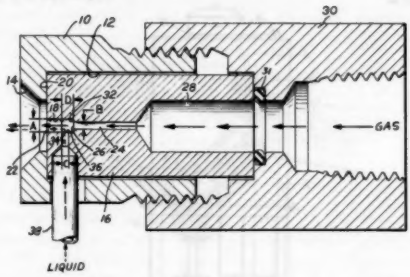
Continuation of Ser. No. 66,810, Aug. 25, 1970, abandoned. This application Apr. 19, 1972, Ser. No. 245,677

Int. Cl. B05b *7/04*

U.S. Cl. 239—434 **6 Claims**

In an aspirating spray head, fluid is introduced by way of an air inlet passage through one end of a larger diameter receiving passage which is open at its other end and liquid is introduced to the receiving passage by way of a liquid inlet

passage which laterally opens into the receiving passage between its end. The end of the receiving passage through which the air inlet passage opens is defined by an abrupt shoulder which lies in a plane perpendicular to the receiving and air inlet passages, and the edge of the openings through which the air and liquid inlet passages open into the receiving passages are spaced from each other. When air is introduced into the receiving passage from the air inlet passage, liquid is



aspirated through the liquid inlet passage and mized with the air in the receiving passage where the mixture is discharged therefrom as a spray. The ratio of the diameter of the receiving passage to the diameter of the air inlet passage is preferably between approximately 1.6 and 2.5 and the ratio of the distance between the openings of the liquid and air inlet passages to the diameter of the air inlet passage is preferably less than approximately 2.0.

3,770,210
WATER SWEEP

Clarence W. Veltkamp, 4040 Willow Springs Rd., Central Point, Oreg.

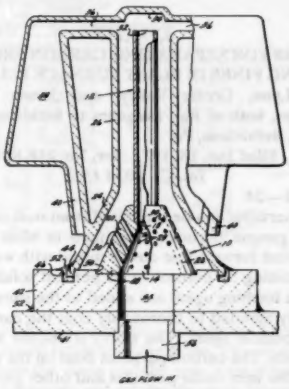
Filed Sept. 7, 1972, Ser. No. 286,891
Int. Cl. B05b *15/06, 1/20*
U.S. Cl. 239—532 **6 Claims**

A device for attachment to a conventional garden hose, which is supported on caster wheels, which is manually propelled and which includes a plurality of spray nozzles directed downwardly and forwardly for sweeping a surface over which the device is propelled for cleaning debris from the path traversed by the device. The caster wheels enable the manifold which carries the spray nozzles to be disposed at an angle to the direction of travel of the device for sweeping the debris to either side of the path over which the manifold travels.

3,770,211
GAS DISTRIBUTOR FOR CASTING MOLD MANUFACTURE

Wilbur H. Schweikert, and John S. Mosier, both of Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Division of Ser. No. 195,284, Nov. 3, 1971, Pat. No. 3,731,650. This application Jan. 9, 1973, Ser. No. 322,166
Int. Cl. B05b *1/14*
U.S. Cl. 239—567 **3 Claims**

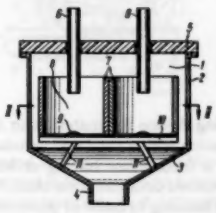


A gas distributor nozzle adapted to be inserted within a mold cup for coating the cup includes an extended tubular element seated on the small end of a frusto-conical member. Conduit means through the extent of the of the member connunicates said gas to the tubular element and to a plurality of apertures distributed about said member, each aperture extending upwardly and outwardly through the wall of said member towards said element.

3,770,212
METHOD OF COMMINUTING MATERIALS PREFERABLY CONDUCTING MATERIALS, AND AN APPARATUS FOR ACCOMPLISHING THE SAME

Gennady Andreevich Kassir, prospekt Oktyabrsky, 2, kv. 44; Evgeny Markovich Temnikov, prospekt Oktyabrsky, 8, kv. 29; Nikolai Fedorovich Umrilov, ulitsa Bardina, 9, kv. 24, all of Novokuznetsk Kemerovskoi oblasti; Ivan Ivanovich Kurenkov, Fersmana, 3, kv. 89, Moscow; Vyacheslav Grigorievich Lukyanchikov, prospekt Ordzhonikidze, 48, kv. 67, Novokuznetsk Kemerovskoi oblasti; Viktor Artemievich Guryanov, ulitsa Nevskogo, 5, kv. 3, Novokuznetsk Kemerovskoi oblasti; Vasily Alexeevich Ivashkin, ulitsa Gorkovskaya, 59, kv. 13, Novokuznetsk Kemerovskoi oblasti, and German Vasilievich Serov, ulitsa Lenina, 44, kv. 20, Novokuznetsk Kemerovskoi oblasti, all of U.S.S.R.

Filed Apr. 8, 1971, Ser. No. 132,426
Int. Cl. B02c *19/18*
U.S. Cl. 241—1 **7 Claims**



A method for the comminution of materials under the effect of current wherein the material to be comminuted is first

shaped in the form of a stream or jet and thereafter fed in the interelectrode space.

An apparatus for accomplishing said method which comprises a working chamber which accommodates at least one hollow and one earthed electrode, the material to be comminuted being fed as a stream or jet shaped by the hollow electrode into the space between said electrodes.

3,770,213

PROCESS FOR SEPARATING CARBON FROM IRON-BEARING FINES IN BLAST FURNACE FLUE DUSTS

John D. Lynn, Center Valley, and James L. Sloughfy, Bethlehem, both of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Jan. 18, 1972, Ser. No. 218,828

Int. Cl. B03d *1/02*

U.S. Cl. 241—24 **14 Claims**

Carbon particles can be separated from iron oxide particles and other gangue particles contained in blast furnace flue dust. The blast furnace flue dust is mixed with water to form a slurry containing 50 percent to 70 percent solids. A flotation agent and a forthing agent are added to the slurry. The slurry is vigorously agitated to thoroughly coat the carbon particles with the flotation agent. The slurry is diluted and passed to flotation cells. The carbon particles float on the surface of the slurry and the iron oxide particles and other gangue particles do not float atop the slurry. The carbon particles are collected as a float product while the iron oxide particles and other gangue particles are collected as a sink product.

3,770,214

FINE GRINDING DEVICE

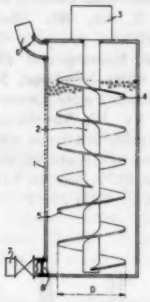
Kalman B. Gabor, 9 rue des Dardanelles, Paris, France

Filed Nov. 10, 1971, Ser. No. 197,273

Claims priority, application France, Nov. 10, 1970, 7040365; Nov. 13, 1970, 7040704

Int. Cl. B02c *17/16*

U.S. Cl. 241—42 **23 Claims**



A comminuting device for materials in a dry or wet phase comprises a housing with a rotatable actuator therein which is in the form of a feed screw having at least two oppositely directed feed sections on a common shaft. Balls are freely displaceable in the housing to assist or promote the comminution process. Housings of various cross-sectional shapes are described which can be used for devices for intermittent and/or continuous operation.

3,770,215

COMMINUTING DEVICE

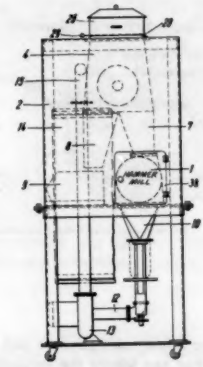
Paul Wittke, Rodenbach, Germany, assignor to Condux-Werk-Herbert A. Merges KG, Wolfgang bei Hanau, Germany

Filed Oct. 12, 1971, Ser. No. 187,955

Claims priority, application Germany, Oct. 21, 1970, P 20 21 576.8

Int. Cl. B02c *19/12*

U.S. Cl. 241—77 **13 Claims**



A device for processing cremation residues, in which magnetic portions are removed from a residue. The cleaned residue is comminuted and conducted away and is emptied into an urn. Comminuted residue fine dust is filtered out of an air stream, and only fine dust is drawn from the conducting conduit which brings comminuted residue out of the comminuting device, this dust being forced in an air stream through the filtering device.

3,770,216

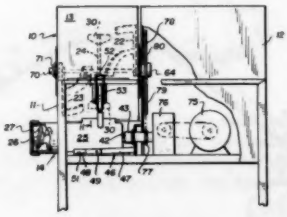
SUBDIVIDED MEAT MIXER AND GRINDER

James A. Holly, Park Forest, Ill., assignor to Hollymatic Corporation, Park Forest, Ill.

Filed Mar. 10, 1972, Ser. No. 233,578

Int. Cl. B02c *18/00;* **B01f** *7/04*

U.S. Cl. 241—82.1 **9 Claims**



A mixing and grinding apparatus for subdivided grindable material such as coarsely cut raw meat having a mixing chamber for the material, mixing elements including a shaft and mixing blade means thereon, a grinder having an access opening between the mixing chamber and the grinder housing, a clamping device for clamping together the wall of the mixing chamber and the housing of the grinder to provide a substantially fluid tight seal between access openings in the mixing chamber and the grinder housing and a securing device operated by the clamping means for simultaneously releasably securing the chamber on a supporting frame while clamping the mixing chamber wall to the grinder housing.

3,770,217

COALING INSTALLATION FOR POWER PLANTS

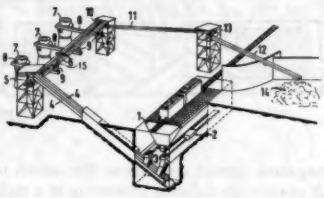
Eberhard Maier; Walter Endler, both of Erlangen, and Paul Haack, Erlangen-Buchenbach, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin/Munich, Germany

Continuation of Ser. No. 834,619, June 18, 1969, abandoned. This application Sept. 15, 1971, Ser. No. 180,859

Claims priority, application Germany, June 19, 1968, P 17 57 836.8

Int. Cl. B02c *23/02*

U.S. Cl. 241—135 2 Claims



Coaling installation for power plants includes a single coal supply bin, a plurality of coal crushers, coal feeding means for the crushers, respective chutes sealingly connected at one end to the coal feeding means, endless conveyor means for conveying from supply bin to distribute coal in excess of the capacity of the crushers, the conveyor means being formed with discharge openings and overlying the other end of the chutes so that the openings are alignable with the chutes for discharging therethrough into the crushers a quantity of coal substantially equal to crusher capacity, and additional means for conveying excess coal remaining on the endless conveyor means to a coal dump.

3,770,218

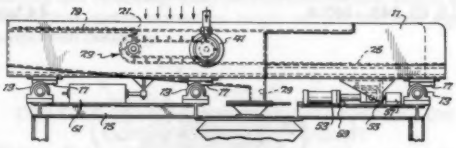
APPARATUS FOR GRANULATING MOLDED SAND

James H. Carpenter, Hagerstown, Md., assignor to The Carborundum Company, Niagara Falls, N.Y.

Filed Jan. 3, 1972, Ser. No. 214,585

Int. Cl. B02c *19/00*

U.S. Cl. 241—301 13 Claims



In an apparatus for granulating molded sand, the feed material including lumps of molded sand from a first conveying surface are discharged onto the upper section of an endless conveyor which moves the material through a stream of abrasive particles and discharges the granulated sand and accumulated abrasive particles on a second conveying surface.

3,770,219

WINDING MACHINE

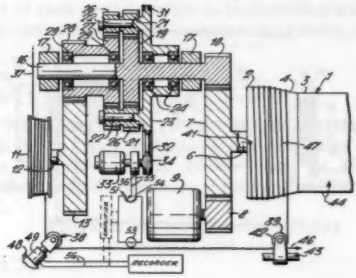
Malcolm Douglas Hickman, Dandenong, Australia, assignor to Rocla Concrete Pipes Limited, Princes Gate, Melbourne, Australia

Filed Sept. 1, 1971, Ser. No. 177,075

Int. Cl. B21f *17/00*; B65h *77/00*

U.S. Cl. 242—7.22 5 Claims

Apparatus for forming a prestressing winding on a concrete pipe. The pipe is supported and rotated and the wire is fed to it so that it is wound onto the pipe. Before passing onto the pipe the wire passes around a rotatable drum which is rotated such that tension is maintained in the wire being fed onto the pipe. A differential coupling connected between the rotatable drum and the means supporting the pipe for rotation. A variable braking means is comprised of an electromagnetic coupling and a motor which act upon a rotatable planet carrier of the differential coupling. The braking establishes a torque in the coupling that resists rotation of the drum. The resulting torque reaction between the drum and the gear train is transferred to the means that supports and rotates the pipe. Inasmuch as tension of the wire is caused, the resisting torque of the gear train a control of the resisting torque will insure constant tension on the wire regardless of the rate of wire take-off.



3,770,220

DEVICE FOR READYING THE UNWINDING PROCESS OF COPS

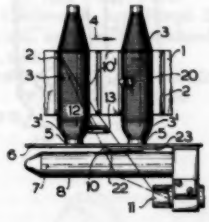
Willi Kupper, Rickelrath, Germany, assignor to W. Schlafhorst & Co., Monchengladbach, Germany

Filed Sept. 28, 1971, Ser. No. 184,468

Claims priority, application Germany, Sept. 29, 1970, P 20 47 729.6

Int. Cl. B65h *54/22*

U.S. Cl. 242—35.6 E 4 Claims



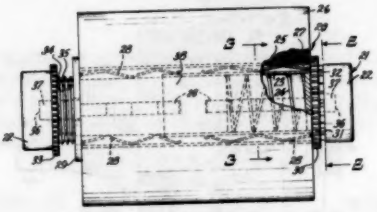
A pivotally mounted thread gripping device is provided in the guide path of cops at substantially the height of the base of the cops. The device is pivotable in the direction of travel of the cops and is in operative proximity with the cops. The device is actuated by each cop as it passes to pick up the exposed section of thread.

3,770,221

BRAKE ACCESSORY FOR ROLLS OF TOILET PAPER AND THE LIKE

Mitchel Stern, 28 S. 4th St., Camden, N.J.

Filed Oct. 22, 1971, Ser. No. 191,858
Int. Cl. B65h 19/00
U.S. Cl. 242—55.2 4 Claims



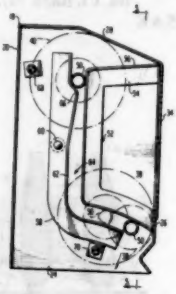
An accessory for rolls of paper and the like, wherein the accessory includes a means for preventing the paper or other material from being unwound from the roll too quickly, especially after a portion of the material has been removed from the roll.

3,770,222

DISPENSER FOR ROLLS OF FLEXIBLE SHEET MATERIAL HAVING MEANS FOR HOLDING A ROLL IN A RESERVE POSITION

Paul W. Jespersen, Stamford, Conn., assignor to Georgia-Pacific Corporation, Portland, Oreg.

Continuation-in-part of Ser. No. 36,855, May 13, 1970, Pat. No. 3,690,580, which is a continuation-in-part of Ser. No. 784,307, Dec. 17, 1968, abandoned. This application Mar. 24, 1971, Ser. No. 127,510
Int. Cl. A47k 10/22
U.S. Cl. 242—55.3 4 Claims



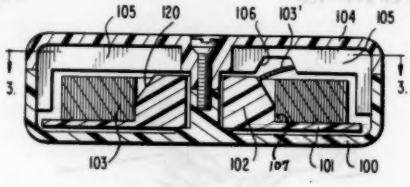
A dispenser for flexible sheet material rolls including means for supporting a first roll in a dispensing position and means for releasably holding a second roll in a reserve position. The releasable holding means consists of a lever member which extends from the dispensing position to the reserve position and senses when the first roll is exhausted, whereupon the lever member releases the second roll from the reserve position automatically.

3,770,223

MAGAZINE FOR AN ENDLESS FILM

Sho Takahama, Nishinomiya-shi, Hyogo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 26,572, April 8, 1970, abandoned. This application Apr. 14, 1972, Ser. No. 244,167
Claims priority, application Japan, Apr. 17, 1969, 44/29837
Int. Cl. B65h 17/48
U.S. Cl. 242—55.19 A 2 Claims



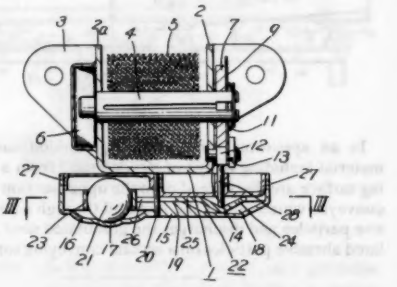
A film magazine carries an endless film which is wrapped about a hub portion on a flange extending at a right angle to the axis of the hub, the hub having a first cylindrical portion in contact with the inntermost convolution of the film near the flange, and having a tapered hub portion remote from the flange. A rib within the cover of the film magazine which maintains the film convolutions on the hub in proper position is recessed at the point where it overlies the innermost film convolution and a portion of the tapered surface portion, the rib being positioned circumferentially at the point where the innermost convolution leaves the hub, the depth of the recess within the rib and the demarcation between the tapered portion of the hub and the cylindrical portion of the hub is approximately equal to the thickness of the film to insure edge contact only between the innermost convolution and the point of removal from the hub and the tapered surface portion of the hub and the rib respectively.

3,770,224

AUTOMATIC LOCK-UP DEVICE FOR SAFETY BELT

Yoshihiro Hayashi, Toyota, and Masahiro Iwatsuki, Anjo, both of Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi-ken, Japan

Filed Sept. 28, 1971, Ser. No. 184,362
Claims priority, application Japan, Oct. 7, 1970, 45/99739
Int. Cl. A62b 35/02; B65h 63/04
U.S. Cl. 242—107.4 4 Claims



An automatic lock-up device for a safety belt which comprises a lock-up gear secured to a belt wind-up or rewind sleeve, a lock-up lever pivotally mounted to a belt housing so as to be oscillable into engagement with said lock-up gear for restraining rotation of the safety belt in the pay-out direction, a lock-up control plate movable in a horizontal plane and comprising an annular section at one side and a conical sec-

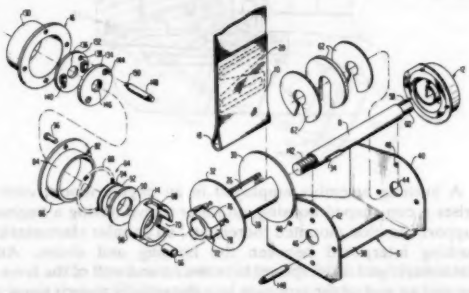
tion at the other side, a spherical body encircled by said annular section and movable on a saucer-like housing upon sensing vehicle acceleration or deceleration, and an axially movable motion-transmitting pin normally resting at its lower part on the central part of said conical section of said control plate and abutting at its upper end with said lock-up lever.

3,770,225

SAFETY SEAT-BELT AND SHOULDER-BELT RETRACTORS INCLUDING A PROGRAM METERING ELECTRICAL SWITCH

Oliver W. Boblitz, Washington, D.C., assignor to Safety Systems, Inc., Washington, D.C.

Filed Oct. 7, 1971, Ser. No. 187,301
Int. Cl. A62b *35/02*; **B65h** *63/04*
U.S. Cl. 242—107.4 **3 Claims**



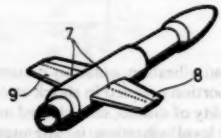
Safety seat-belt retractors are made with roller pawl means having the free-run direction in the belt retracting direction of the retractor and means biasing the rollers of the pawl means against movement into the no-run position, e.g., where the rollers are moved outwardly by a cam for the no-run position, a coiled spring ring biases the rollers inwardly against their outward movement into the no-run or locking position. With such a retractor, the seat-belt may be slowly moved either in or out for any distance of its length, e.g., when the occupant of the vehicle wishes to adjust position upon the vehicle seat, but the belt is instantly locked against extension (unrolling) if a quick pull is exerted upon it, e.g., where sudden deceleration of the vehicle would tend to throw the occupant of the seat forward. Such retractors provide emergency-locking and automatic unlocking and relocking. They may include electric switch elements that meter extraction length of the belt and signal proper belt fastening.

3,770,226

CONTROL DEVICE FOR ADJUSTING A PENDULUM CONTROL OF A FLYING BODY

Walter Kranz, Munich, Germany, assignor to Bolkow Gesellschaft mit beschrankter Haftung, Munich, Germany many

Filed Apr. 18, 1968, Ser. No. 723,349
Int. Cl. B64c *21/08*
U.S. Cl. 244—3.21 **14 Claims**



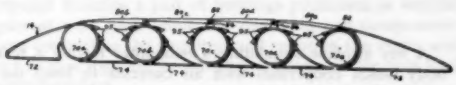
A control device for adjusting a pivotal control wing or similar surface defining member particularly for flying bodies includes means for directing a fluid stream of liquid, gas or pulverant material transverse to the flow stream over the control surface. The pendulum control comprises, for the purpose of this application, control surfaces which are not subject to exterior control forces effected by mechanical control elements. The fluid screen or stream which is provided to control purposes the pivotal orientation of the wing in respect to the body may be directed outwardly from the control surface itself or from a body adjacent the surface and advantageously separate fluid stream controls are provided for the top and bottom of each pivotal surface to be controlled and the fluid stream control is preferably connected for blowing in selected areas.

3,770,227

JET WING WITH MULTIPLE THRUST AUGMENTORS

Hans J. P. Von Ohain, and Charles A. Scolatti, both of Dayton, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sept. 10, 1971, Ser. No. 179,532
Int. Cl. B64c *3/00, 21/04*
U.S. Cl. 244—42 CC **1 Claim**



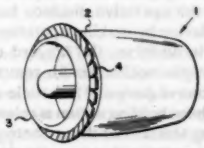
The invention relates to an aircraft with VTOL or STOL operational capability. In accordance with the invention, the wing, or airfoil contour, is provided with a plurality of spanwise extending slots or ducts having inlet and outlet openings in the suction and pressure surfaces respectively of the wing. The slot openings are normally closed by spanwise extending flaps which fair into the airfoil contour and when the slots are open cooperate therewith to form individual thrust augmenting ducts. A large number of primary nozzles are provided for injecting high pressure air, derived for example from the bypass air of a conventional turbofan engine, into the ducts. The injected air is delivered as individual jets moving downward in the direction from the suction to the pressure surface of the airfoil and inducing a flow of ambient air from above the wing to mix with the primary air from the jets. The increased mass flow from the thrust augmentor ducts will give rise to vertical thrust or lift which may be of the order to twice the thrust which would have been produced by the primary air alone. The flaps on at least the suction surface are individually operable both as to magnitude and rate of displacement so as to provide for varying conditions of flight operation.

3,770,228

AIR INLET FLAP

Johan Traksel, Chatsworth, and Joseph D. Dupcak, Studio City, both of Calif., assignors to Lockheed Aircraft Corporation, Burbank, Calif.

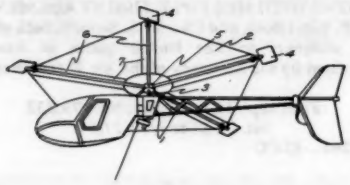
Filed Dec. 8, 1971, Ser. No. 205,882
Int. Cl. B64d *29/00*
U.S. Cl. 244—53 B **10 Claims**



A series of inlet fences or spoilers carried on the nacelle of an aircraft turbine engine which are used to selectively divert

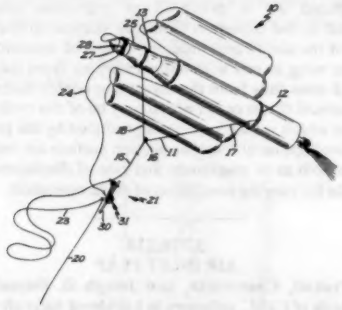
streamlines which would otherwise become detached at the inlet lip. This selectively variable air-inlet geometry provides for minimum drag during cruise and yet obviates engine surge or stall or other effects detrimental to the engine which could otherwise occur on the ground and at low forward velocity when crosswinds combine with high engine power demands.

3,770,229
TOY AIRPLANE
Uwe C. Seefluth, Seestr. 16, Klingberg, Germany
Filed Apr. 30, 1971, Ser. No. 139,019
Int. Cl. B64c *31/06*
U.S. Cl. 244—154 **2 Claims**



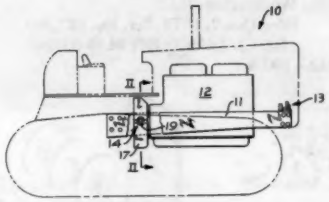
A toy airplane simulating a helicopter having a rotating body which cooperates with air currents to keep the toy steadily floating in the air.

3,770,230
REMOTE CONTROL SYSTEM FOR KITES AND THE LIKE
Orin B. Johnston, 5548 W. 78th Street, Minneapolis, Minn.
Filed July 13, 1972, Ser. No. 271,394
Int. Cl. B64c *31/06*
U.S. Cl. 244—155 A **10 Claims**



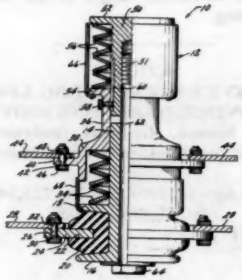
A remote control system for kites and other lanyard controlled devices. The system provides a selectively releasable control linkage between the control lanyard and the controlled device. An operator initiated jerk will release the linkage to increase the operative distance between the operator and controlled device by making operational a section of connecting tether. In addition, the lanyard control system may also employ a simple mechanism for remotely releasing an article from the control device. The article is held in place by a resilient band whose holding action is released upon activation of the connecting tether. For those control devices which employ a multiple connection between the device and the control lanyard, this system also provides a simple device which allows a rapid and easy adjustment in the length ratio of two of the connections.

3,770,231
ENGINE MOUNT WITH THRUST LIMITING AND DAMPING MEANS
Edwin M. Kirchgessner; Nelson A. Jones, and Ronald R. Anderson, all of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed June 2, 1972, Ser. No. 259,166
Int. Cl. F16m *5/00*
U.S. Cl. 248—9 **5 Claims**



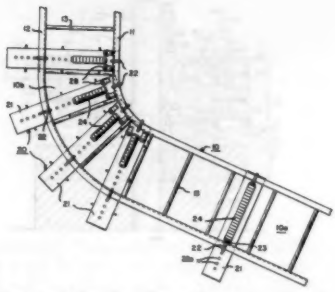
A bushing assembly employed in an engine mount comprises a cup-shaped housing, an inner sleeve having a engine support trunnion mounted therein and an annular elastomeric bushing interposed between the housing and sleeve. An elastomeric pad is interposed between an end wall of the housing and an end of the trunnion to substantially absorb impact loads imposed thereon by the trunnion.

3,770,232
SHOCK AND VIBRATION ISOLATION MOUNT
John Calvin Blake, Cincinnati, Ohio, assignor to General Electric Company, Lynn, Mass.
Filed Apr. 4, 1972, Ser. No. 240,998
Int. Cl. F16f *15/00*
U.S. Cl. 248—21 **3 Claims**



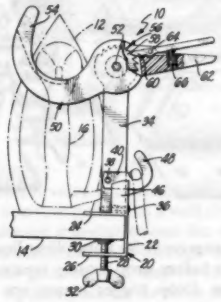
A shock and vibration isolation mount includes a resilient elastomeric portion coupled in shock attenuating series with a stacked plurality of dished, disc-shaped annular metal springs. Normal low level vibration is attenuated by the resilient elastomeric portion acting alone, whereas high intensity shocks of sufficient magnitude to compress the resilient elastomeric portion to a substantially incompressible form of near infinite spring constant are continually attenuated by the stacked metal springs.

3,770,233
CABLE DRAW MECHANISM
James A. McElroy, Box 232, Babcock Blvd., Rt. No. 4, Gibsonia, Pa.
Continuation-in-part of Ser. No. 6,200, Jan. 27, 1970, Pat. No. 3,637,175. This application Jan. 13, 1971, Ser. No. 106,177
Int. Cl. B65h *51/22*
U.S. Cl. 248—55 3 Claims



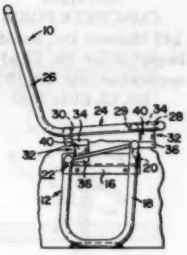
A cable draw mechanism is provided for use in cable trays having spaced side rails and transverse rungs comprising an elongated base member extending from beneath one of said spaced side rails to the other between said rungs, a pair of vertical standards on the base member, a shaft between said vertical standards generally parallel to said base, a plurality of side by side rollers on said shaft and fastening means on the base engaging one of said rungs and said side rails to hold the base in place between said rails.

3,770,234
CADDY FOR HANDLED APPLIANCE
Nettie L. Fovall, 1444 W. McKinley Ave., Pomona, Calif.
Filed July 23, 1971, Ser. No. 165,631
Int. Cl. F16m *13/02*
U.S. Cl. 248—117.7 1 Claim



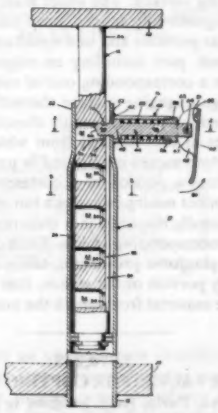
A caddy for an iron, or the like, including a base adapted to be clamped to an ironing board, or the like, a post carried by the base, a hook pivotally connected to the post and insertable through an engageable with the handle of the iron, and a rachet and pawl for locking the hook relative to the post in a position to engage the handle and support the iron.

3,770,235
RESILIENTLY SUPPORTED SEAT
Edward H. Klapproth, Mansfield, and Donald J. Sparr, Loudonville, both of Ohio, assignors to The Flexible Co., Loudonville, Ohio
Filed Mar. 20, 1972, Ser. No. 236,484
Int. Cl. A47c *3/025*
U.S. Cl. 248—399 4 Claims



A resilient seat support wherein an upper frame and a lower frame are provided in a seat and resilient isolation dampeners support the upper frame on the lower frame. Each isolation dampener includes a pair of bushings positioned in vertical alignment with each other and centering and compression means connecting the bushings and securing the upper and lower frames together by cushioning means as the sole load support members.

3,770,236
VERTICALLY ADJUSTABLE SUPPORT
Douglas D. Marsh, and John C. Newlin, both of Auburn, Ind., assignors to H&M Enterprises, Garrett, Ind.
Filed Sept. 27, 1971, Ser. No. 184,109
Int. Cl. F16m *11/04*
U.S. Cl. 248—408 6 Claims



A vertically adjustable seat support assembly for chairs, stools and the like. An elongated tubular member has its lower end supported on a base, and an elongated support post is telescopically received in the tubular member and is vertically movable with respect thereto, the upper end of the support post supporting the seat. The post member has a plurality of vertically aligned, spaced holes formed therein. A locking mechanism is provided including a pin and a mechanism on the tubular member for selectively moving the pin laterally between a locking position seated in a selected hole and an unlocked position withdrawn therefrom thereby to hold the post member in a plurality of selected vertical positions. An annular, inwardly extending flange defines the entrance of each hole and the pin has an upwardly facing notch therein which is

engaged by the flange in the locking position of the pin in response to a load on the post member thereby preventing withdrawal of the pin to the unlocked position. The locking end of the pin is further provided with an inclined surface that assures locking engagement of the pin with the support post during downward movement of the latter.

3,770,237

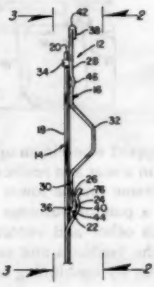
CONCRETE FORM

Duane C. Burton, 145 Mohawk Dr., Boulder, Colo.

Continuation-in-part of Ser. No. 12,611, Feb. 19, 1970, abandoned. This application Sept. 23, 1971, Ser. No. 183,200

Int. Cl. E01c *7/00*

U.S. Cl. 249—3 **8 Claims**



A concrete form useful in forming a key contraction joint between concrete slabs. The concrete form comprises a plurality of spaced-apart, aligned stakes and an elongate rigid sheet material member having upper and lower longitudinally extending, generally coplanar portions and a longitudinally key deformation portion interposed between and connected to said planar portions. At least some of the stakes have a pocket means formed thereon. Each pocket means includes an edge engaging surface. The sheet material member has a plurality of longitudinally spaced strap means formed within one of the planar portions and said member includes a plurality of parts, each part including an edge portion which is disposed within a corresponding one of said pocket means to contact the edge engaging surface thereof to prevent movement of said member in an upwardly direction by utilizing the shear properties of the material from which said member is formed. Each strap means is disposed in partial encompassing engagement about a portion of a corresponding one of said stakes. Each pocket means includes a tab means having a portion thereof biasedly disposed in a direction toward the body portion of its corresponding stakes. Each of the parts of said member has a planform projection, taken in a direction normal to the body portion of the stakes, that is greater than the thickness of the material from which the member is formed.

3,770,238

TRACER VALVES FOR COPYING MACHINES

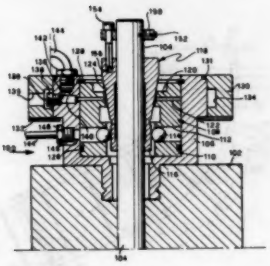
Roberto De Nova, Pavia, Italy, assignor to Duplomatic S.p.A., Busto Arsizio (Varese), Italy

Filed Sept. 3, 1971, Ser. No. 177,738

Int. Cl. B23q *35/16*

U.S. Cl. 251—3 **18 Claims**

A tracer valve has a stylus that is automatically biased to contact a template, despite changes in curvature of the template. The stylus has or is connected to a pressure-bearing surface. A plurality of nozzles for compressed air are spaced apart in the valve in a circle around the pressure-bearing surface, the air they emit impinging on that surface. There is a similar series of cylinders containing pressure members such as pistons spaced around the same or a different pressure-bearing surface. The interior of each nozzle is connected to an associated cylinder, spaced at a chosen angle from the nozzle. Each nozzle-cylinder combination is connected individually to a source of pressure fluid. The stylus approaches one of the nozzles more closely than others when the valve is operating, closing that nozzle and raising the pressure in it and its associated cylinder. The pressure member in that cylinder accordingly exerts a biasing force on the stylus. If the curvature of the template changes, the stylus approaches another nozzle and the direction of the biasing force correspondingly changes.



This invention relates to tracer valves for copying machines, and in particular to tracer valves in which a stylus bears against a relatively moving template. Changes in the direction of relative movement, corresponding to changes in the contour of the template, are transmitted through the tracer valve and certain controls to govern the movement of a workpiece relatively to a machine tool in order to give the workpiece the contour of the template.

3,770,239

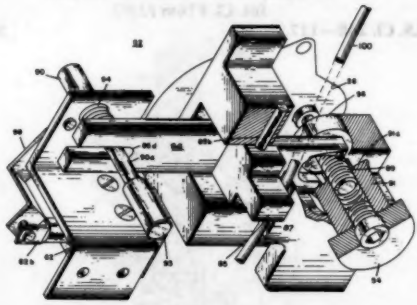
LIQUID FLOW CONTROL ARRANGEMENT

Richard P. Stobbe, Haines City, and Richard V. Knapp, Winter Haven, both of Fla., assignors to Nilsen Mfg. Co., Haines City, Fla.

Division of Ser. No. 120,229, March 2, 1971, Pat. No. 3,700,904. This application June 12, 1972, Ser. No. 262,927

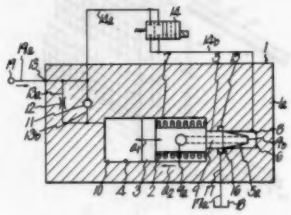
Int. Cl. F16k *7/06*

U.S. Cl. 251—9 **2 Claims**



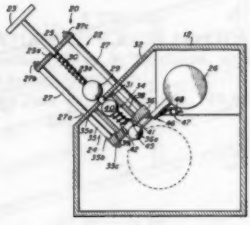
A monitor arrangement for controlling liquid flow rate in a line which passes before drop sensing means which sense the passage of drops. Drop trigger means are coupled to and responsive to the drop sensing means and provide an output pulse at the passage of each drop. Triggered by this output pulse are time trigger means which provide a pulse of a predetermined time interval. Logic and comparison means are coupled to said drop and time trigger means to judge the flow rate and motor means are in turn driven by said logic and comparison means. A line valve is responsive to the motor means which regulates the liquid flow in the valve.

3,770,240
ACCELERATION AND DECELERATION VALVE APPARATUS
Akio Mito, Yokohama; Masayasu Desaki, Tokyo; Kunio Koike, Hayama-Machi, and Shunji Kikui, Tokyo, all of Japan, assignors to Kabushikikaisha, Tokyo Keiki, Tokyo, Japan
Filed Jan. 24, 1972, Ser. No. 220,319
Int. Cl. F16k *21/04*
U.S. Cl. 251—15 **12 Claims**



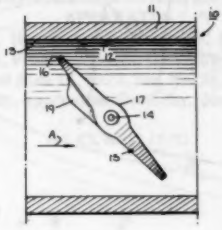
Acceleration and deceleration valve apparatus having a housing body with a bore formed therein, a piston slidably inserted in the bore, a bias device for biasing the piston, a throttle device the opening of which is controlled by the piston, the piston dividing the bore into front and back chambers, an oil passage connecting the two chambers, a valve device provided in the oil passage, a pressure inlet for supplying oil to the oil passage, and an outlet for flowing out the oil through the throttle device.

3,770,241
IMPACT CONTROL VALVE
Richard J. Allen, 32 Lane No. 8, Gaspee Point, Warwick, R.I.
Filed June 15, 1971, Ser. No. 153,295
Int. Cl. F16k *31/10, 31/524*
U.S. Cl. 251—76 **16 Claims**



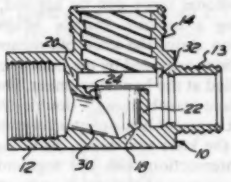
A fluid flow control valve is operated to close and at least partially open an aperture defined in a wall dividing the casing of the valve. A closure member covers the aperture thereby preventing a fluid communication through the wall when the valve is in a closed position, and may be rotated to either a fully or partially opened position to allow fluid communication. A means is provided for causing rotation of the closure member and includes motion transfer means for coupling an externally applied force to the closure member. An impacting member is mounted outside the casing for applying the external force by striking against an outer portion of the casing, and the means for causing rotation may include a one way clutch responsive to the striking for rotating the closure member through a predetermined angle.

3,770,242
AERODYNAMICALLY AND HYDRODYNAMICALLY STABLE TORQUED BUTTERFLY VALVE AND VANE
Joseph O'Connor, Jr., Goshen, N.Y., assignor to Kieley & Mueller, Inc., Middletown, N.Y.
Filed Nov. 16, 1971, Ser. No. 199,263
Int. Cl. F16k *1/22, 39/00*
U.S. Cl. 251—305 **15 Claims**



The vane is provided with a baffle or flow guide at the aerodynamic center to effect an approximately equal flow velocity above and below the vane at that point. The differential pressures acting on the vane are approximately balanced for a substantial angular opening portion of the vane while being of reduced magnitude up to about 80° of flow opening until reversing. The dynamic torque on the butterfly valve is substantially reduced by means of the baffle.

3,770,243
VALVE BODY
Robert M. Zell, and Reginald R. Maxwell, both of Detroit, Mich., assignor to Brass-Craft Manufacturing Co., Detroit, Mich.
Filed May 4, 1972, Ser. No. 250,139
Int. Cl. F16k *27/00*
U.S. Cl. 251—366 **3 Claims**



A valve body for an under fixture plumbing valve, of the type known as a straight valve, and having end nipples and a central valve stem nipple, generally of the class of valves shown in a prior U.S. Pat. to R.M. Zell No. 3,417,450 of Dec. 24, 1968.

The valve body is improved by having transverse barrier walls whose upper parts form a valve seat; one of the walls has in its lower part an orifice communicating a holding chamber with one end nipple; the other wall has an orifice in the form of an elongated, transverse slot above the valve seat formation and communicating the holding chamber with the second end nipple.

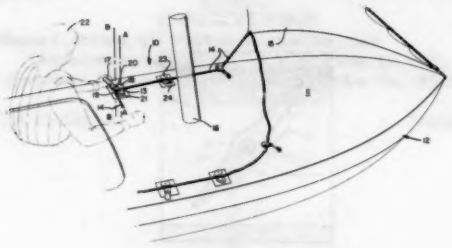
ERRATUM

For Class 251—282 see:
Patent No. 3,770,247

3,770,244
WINCH MECHANISM

Robert A. McCloud, 17982 Walnut Rd., Castro Valley, Calif.

Filed Jan. 18, 1972, Ser. No. 218,668
Int. Cl. A63b 61/04
U.S. Cl. 254—164 13 Claims



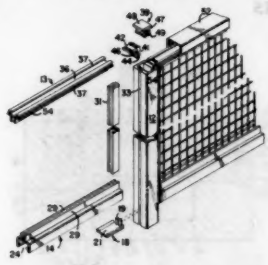
A winch of the type for providing windup force to running rigging, such as sheets of a vessel, constitutes an elongated cylindrical winch drum pivotally attached to a stationary spindle mounted to a base or stable surface, such as a deck or the like, of the vessel, and a hand-powered leverage bar employed to rotate the winch drum about the spindle during stroking movement of the leverage bar in a first angular direction over an arcuate sector defined by a sector angle θ measured at the spindle for the purpose of tensioning the rigging connected in gripping contact with the working surface of the drum. The improvement of the present invention utilizes only a sector of the total available circumferentially extending working surface of the drum, the sector of the drum being in contact with only a small amount of the running rigging, yet providing the required amount of buildup force for performing useful work. In one aspect of the present invention, a linking assembly is utilized for permanently connecting the leverage bar relative to the spindle. The linking assembly includes a planar toggle bar. The toggle bar has an end permanently connected to the drum so that both are of rotation of substantially parallel to that of the stationary spindle. Such attachment effectively divides the leverage bar into a handle segment to which human-engendered rotational force can be applied, and a follower segment carrying a capture surface adapted to undergo swingable rotation about the knee pin means in response to operative conditions provided by the human-engendered rotational force applied at the handle segment. During operations, the capture surface travels along a double-crescent pathway, the first crescent segment has a center formation substantially coincident with the knee pin means. Its arcuate travel length terminates in intersection with the segment of the rigging disposed on the sector of the drum utilized to provide the required windup force to the rigging. The result: frictional capture of the segment of rigging between the leverage bar and the drum without the customary need to form several loops or turns of the rigging about the entire circumferential working surface drum. The second crescent pathway segment has a center formation coincident with the stationary spindle. Its travel length is defined by the common sector angle θ. After the rigging is captured between the leverage bar and the drum, the rigging is rotated about the stationary spindle by corresponding rotation of the leverage bar over the sector angle θ to provide the required windup force for tensioning the rigging.

Spring-loaded cam cleats upstream from the linking assembly can be utilized to retain the running rigging in place when the leverage bar is not in capturing contact with the rigging. Such operative condition occurs when the capture segment of the bar is traveling along the aforementioned first crescent pathway segment as well as when the leverage bar is being returned to its original starting position after the running rigging has been rotated through the sector angle θ.

3,770,245
INTERLOCKING FRAME CONSTRUCTION

Robert H. Murdock, Emeryville, Calif., assignor to Rebco West, Inc., Los Angeles, Calif.

Filed Feb. 7, 1972, Ser. No. 223,839
Int. Cl. E04h 17/14
U.S. Cl. 256—24 7 Claims

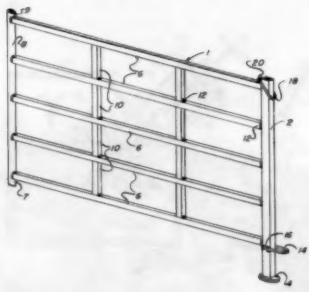


An interlocking frame construction for supporting panels of wire mesh screen or the like is described which is particularly useful in providing barriers along roadways. The frame construction includes a plurality of spaced apart posts between which extend rail members to define with each pair of posts an enclosed frame. Channels are provided extending along the posts and rails and opening toward the center of each frame to receive the edges of a panel to be supported. The rails are connected between the posts by anchors and connectors which enable at least one of the rails to be removed to facilitate replacement of one panel with another, and covering means are provided for normally enveloping the connectors so that unauthorized access thereto is prevented.

3,770,246
MODULAR, UNITARY SECTIONAL, PORTABLE FENCE

Lawrence M. Key, P.O. Box 305, Wichita Falls, Tex.

Filed Dec. 30, 1971, Ser. No. 214,025
Int. Cl. E04h 17/16, 17/18
U.S. Cl. 256—25 4 Claims

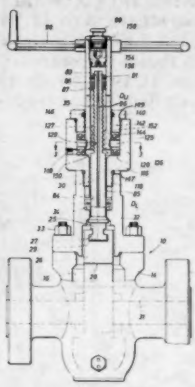


A modular fence unit which is self contained and, together with a brace unit and a simple pin or stake, will make a temporary or permanent pen or corral, which can be constructed of any configuration with any portion being usable as a gate or opening. The present device is preferably of tubular construction for lightness in weight and has one or more vertical braces within the length of each modular unit, which, together with horizontal members form the fence. Provision is made for connecting the modular units by looped elements, one of which is hingeable, and a brace is provided which may be staked in place to provide lateral bracing. Provision is made to stake each post in place with a pin, which pin may be driven by an impact bar adapted to be used within the post and driven into the ground. The fence or corral may be readily disassembled and reassembled without damage to the parts.

3,770,247
GATE VALVE HAVING PRESSURE BALANCED STEM

Norman A. Nelson, Houston, Tex., assignor to Texas Iron Works, Inc., Houston, Tex.

Filed Sept. 29, 1971, Ser. No. 184,871
Int. Cl. F16k *3/00, 31/50*
U.S. Cl. 251—282 22 Claims

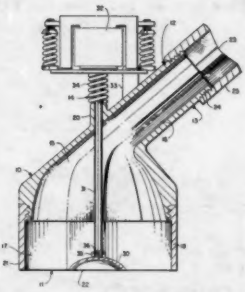


A gate valve assembly of the arising stem type having means to communicate fluid pressure to each extremity of the valve stem for the purpose of controlling the development of forces induced by fluid pressure that might make operation of the valve difficult. The valve stem might be provided with a fluid passage to conduct fluid pressure from the valve body to the outer extremity of the valve stem. A cylinder may be provided about the valve stem within which may be received a piston carried by the valve stem having the effect of defining an effective surface area at the outer extremity of the valve stem that substantially equals or controllably differs from the surface area dimension of the lower extremity of the valve stem thereby causing effluent pressure to develop a desirable resultant force acting upon the valve stem.

3,770,248
VIBRATORY CONCRETE APPLICATOR

Samuel L. Cahoon; Clifton V. Steelman, and Lawrence E. Welch, all of Connell, Wash.

Filed June 4, 1971, Ser. No. 149,954
Int. Cl. B01f *11/00*
U.S. Cl. 259—1 3 Claims

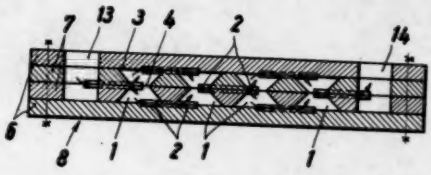


A tool for applying low slump, semi-plastic concrete to a formed supportive matrix to create thin shelled ferro-concrete element. The tool defines a reservoir-like chamber having at least one plunger of some areal extent, reciprocally movable substantially perpendicularly to the output orifice and the motion of concrete outwardly from the orifice and about the supportative matrix upon reciprocation. The plunger is moved by an electro-mechanical powering device. An external source supplies concrete under pressure to the reservoir. Species having variously shaped orifices are disclosed.

3,770,249
MIXING, HOMOGENIZING AND EMULSIFYING APPARATUS

Armin Schmitt, Heusenstamm, Germany, assignor to Firma J. S. Pelzholdt, Frankfurt/Main, Germany

Filed June 15, 1972, Ser. No. 263,316
Claims priority, application Germany, June 18, 1971, P 21 30 134.8
Int. Cl. B01f *15/02*
U.S. Cl. 259—4 11 Claims

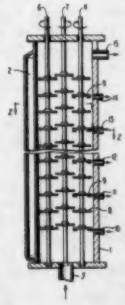


An apparatus for mixing, homogenizing and emulsifying liquid and liquid/solid mixtures comprises a plurality of individual chambers connected in series. Each chamber has the shape of a double frustum and adjacent chambers are connected to each other by supply and discharge channels which enter the individual chambers tangentially.

3,770,250
DEVICE FOR CONTINUOUSLY MIXING OR REACTING LIQUIDS

Yosuke Uchida, Ashigara-Kamigun, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Minami Ashigara-shi, Kanagawa, Japan

Filed June 2, 1971, Ser. No. 149,290
Claims priority, application Japan, June 2, 1970, 45/47383
Int. Cl. B01f *7/26, 3/08*
U.S. Cl. 259—6 4 Claims



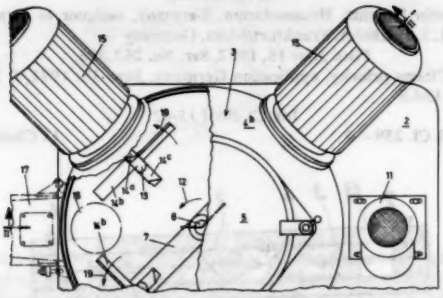
A device for continuously mixing or reacting liquids has a cylinder with a plurality of spaced radial liquid inlets intermediate its ends for sequentially adding liquid and an outlet. An agitator having two or more shafts disposed parallel with the axis of said cylinder also has a plurality of blades fixed on the respective shafts for extremely restricting the mixture and agitation of the liquids on the axial direction but mainly drives the added liquids radially.

3,770,251

APPARATUS FOR MIXING PLASTICS MATERIALS AND THE LIKE DURING PROCESSING THEREOF

Friedrich Walter Herfeld, Wall 1, Neuenrade, Germany

Filed Nov. 8, 1971, Ser. No. 196,496
Int. Cl. B01f 7/00
U.S. Cl. 259—103 6 Claims



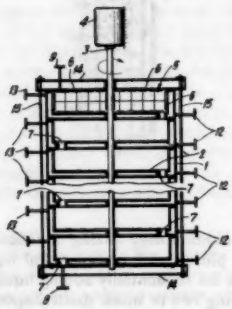
A mixer for mixing plastics materials, chemicals or pharmaceutical products during processing thereof comprising a mixing container, having a vertically disposed longitudinal axis and a lower cylindrically shaped portion and an upper frustum-shaped portion, a power-driven stirring blade vertically disposed through the bottom wall of the container, and a plurality of power-driven mixing blades selectively distributed over and extending through the frustum-shaped portion of the container. The stirring and mixing blades are powered by electric motors, and have triangular cross-sectional shapes which force the material being mixed against the walls of the container to produce, along with the blades and the material, frictional heat required during the mixing process.

3,770,252

APPARATUS FOR TREATING VISCOUS LIQUIDS

Silvano Gordini, and Sergio Noe, both of San Donate Milanese, Italy, assignors to Snam Progetti S.p.A., Milan, Italy

Filed June 19, 1970, Ser. No. 47,783
Int. Cl. B01f 7/16
U.S. Cl. 259—107 4 Claims



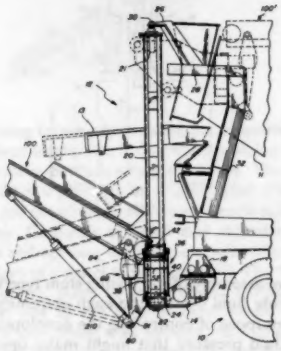
Apparatus is disclosed for subjecting viscous material to a mixing and heat exchange treatment, as in the polymerization of olefins, which consists of a jacketed vertical reaction vessel having horizontal baffles dividing the vessel into zones and providing heat exchange surfaces which are swept by scraping blades supported on arms fixed to a shaft mounted for rotary movement along the axis of the reaction vessel to clean the viscous material from the heat exchange surfaces.

3,770,253

TRUCK MOUNTED TELESCOPABLE CONVEYOR SYSTEM AND METHOD OF STOWING SAME

Charles J. Arndt, and Budd David Cross, both of Marion, Ohio, assignors to Harsco Corporation, Camp Hill, Pa.

Filed June 21, 1971, Ser. No. 154,895
Int. Cl. B60p 1/00; B65g 21/12
U.S. Cl. 259—172 12 Claims



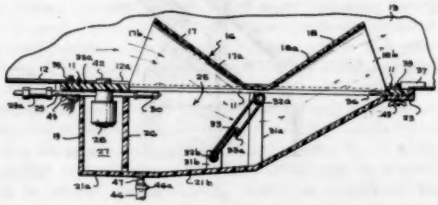
A telescopable conveyor system is mounted to a truck by a vertical column mounting arrangement which permits the telescopable conveyor system to be pivoted in both a vertical and horizontal direction. The mounting arrangement also permits the telescopable conveyor system to be pivoted about vertical axis and elevated to permit stowage of the conveyor system during transit in a position to one side of the truck and extending towards the front of the truck. The telescopable conveyor system is extendable from a fully retracted position to a fully extended position and pop up rollers are provided on the extendable portion of the conveyor system to support the conveyor belt when the conveyor system is in an extended position.

3,770,254

RECEPTACLE TYPE HUMIDIFIER FOR AIR CONVEYING DUCTS AND THE LIKE

William B. Morrow, Winston-Salem, N.C., assignor to Aqua-Mist, Incorporated, Winston-Salem, N.C.

Filed Apr. 20, 1972, Ser. No. 245,714
Int. Cl. B01f 3/04
U.S. Cl. 261—105 20 Claims



A humidifier assembly for use with a forced circulation warm air heating system, including a receptacle portion in the

form of an upwardly opening basin and defining an evaporation chamber having a wire screen therein, and a mounting plate portion to which the receptacle portion can be removably fastened. An air scoop portion having hood formations extending along upwardly diverging axes may be assembled to the mounting plate portion and the latter fastened to the lower wall of the heating duct with the air scoop projecting through an opening in the duct lower wall to divert air downwardly into the evaporation chamber and return the air to the duct. A spray nozzle discharges a spray-mist pattern into the evaporation chamber and against the screen. A twin-duct collar may be substituted for the air scoop to adapt the unit to other installation conditions.

3,770,255

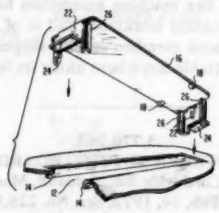
VALVE TRAY HAVING MEANS FOR AVOIDING EDGE EROSION

Dale E. Nutter, 2498 E. 49th, Tulsa, Okla.

Continuation-in-part of Ser. No. 216,106, Jan. 7, 1972, abandoned. This application June 28, 1972, Ser. No. 266,907

Int. Cl. B01d 3/18

U.S. Cl. 261—114 VT **10 Claims**



Valve tray apparatus has an apertured tray deck for supporting a moving body of liquid and valves associated with the apertures in the tray deck, each valve being movable from a lower position where it substantially obstructs the associated aperture to an upper position where vapors pass upwardly through the aperture and into the body of liquid. Erosion-creating edge-to-edge contact between the valve assembly and the tray deck is avoided by providing the tray deck and or the valves with flanges which result in contacting surfaces.

3,770,256

APPARATUS FOR LEVELING THE DECKS OF SHIPS

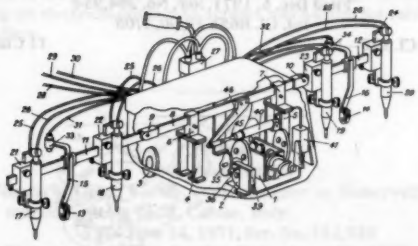
Jacques J. Godin, Triel-sur-Seine, and Jacques A. Stephan, Loire-Atlantique, both of France

Division of Ser. No. 883,720, Dec. 10, 1969, abandoned. This application May 24, 1972, Ser. No. 256,244

Claims priority, application France, Dec. 20, 1968, 68179430

Int. Cl. C21d 7/14

U.S. Cl. 266—4 F **3 Claims**



This invention concerns a method of levelling the decks of ships and other large surfaces of metal sheeting by a succession of heating and cooling processes, as also an apparatus for carrying out the method.

3,770,257

LEVEL CONTROL FOR ROTATING FURNACES

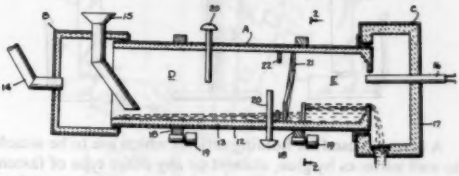
James Alexander Evert Bell, Port Colborne, Ontario, Canada, assignor to The International Nickel Company, Inc., New York, N.Y.

Filed July 2, 1971, Ser. No. 159,259

Claims priority, application Canada, July 8, 1970, 087,693

Int. Cl. F27b 7/16

U.S. Cl. 266—18 **7 Claims**



A horizontally mounted rotary cylindrical furnace is provided with an internal helical flight for at least the preponderant part of one revolution but not more than two revolutions of the furnace so that two zones are formed within the rotary furnace. The pitch of the flight can be controlled so that material fed to the first zone is conveyed to the second zone at a rate greater than the rate of feed to the first zone. The height of the helical flight can be set so a deeper bed and greater retention time is obtained in the solids down stream of the flight. Also disclosed is a discharge mechanism which is a tapered helical rotor with its larger vanes being coextensive with and fixed to the furnace diameter and the smaller vanes being mounted in an co-extensive with and fixed to a take-off conveyer tube.

3,770,258

OIL DAMPER FOR VEHICLES

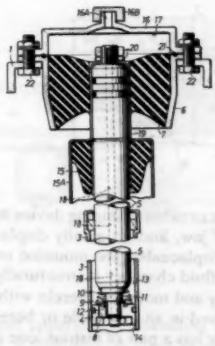
Noriyuki Takahashi, Tokyo; Hidehiko Inoue, Saintama, and Yoshihiko Toshimitsu, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 26, 1972, Ser. No. 247,709

Claims priority, application Japan, Apr. 30, 1971, 46/28734

Int. Cl. B60g 11/62

U.S. Cl. 267—35 **6 Claims**



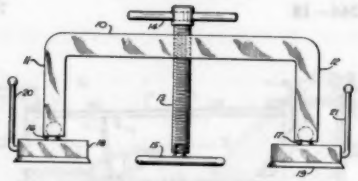
An oil damper for vehicles comprises a closed chamber supported by a body structure of the vehicle, the wall of which chamber is partially formed with an elastic body, such as a rubber disc, and a longitudinally expansible and contractible cylinder with a piston rod, one end of which is connected to the elastic body while the other end thereof is connected to a wheel suspension means of the vehicle. Oil is filled into the chamber and the cylinder, to flow between them through a conduit or hole in the piston, in accordance with the longitudinal expansive and contractive motion of the cylinder.

3,770,259

VACUUMATIC CLAMP

Murray M. Wagreich, 866 E. 46th St., Brooklyn, N.Y.

Filed Oct. 20, 1972, Ser. No. 299,212
Int. Cl. B25b *11/00*
U.S. Cl. 269—21 **2 Claims**



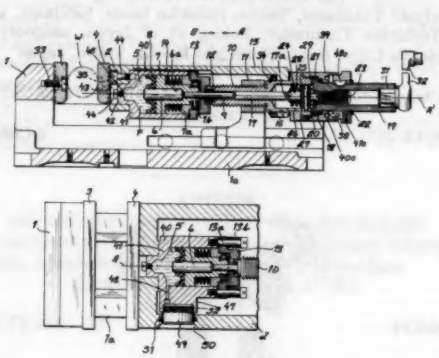
A clamp is used for holding articles which are to be attached to wall surfaces by glue, cement or any other type of fastener. The clamp includes a head adapted to engage the article and carried by a threaded shaft. The shaft is carried in the middle of a U-shaped frame the two ends of which are provided with vacuumatic clamps adapted to engage the wall on opposite sides of the article to be attached.

3,770,260

MACHINIST VISE WITH INDEPENDENT HYDRAULIC-CYLINDER STRUCTURE

Gunter Horst Rohm, Muhlstrasse 9, Sontheim/Brenz, Germany

Filed Oct. 18, 1971, Ser. No. 190,035
Claims priority, application Germany, Oct. 23, 1970, G 70 39 267.5
Int. Cl. B25b *1/02*, *1/24*
U.S. Cl. 269—23 **7 Claims**



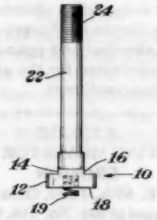
A machinist vise or other clamping device has a support carrying a stationary jaw, and an axially displaceable clamping body carrying a displaceable jaw mounted on the support. A cylinder having a fluid chamber is structurally independent of the clamping body and mounted therein with an axial projection or boss received in an axial hole or bore in the clamping body. The cylinder has a pair of pistons, one of which is annular and surrounds the other, that are coaxial with the projection and the hole. An actuator is connectable to the larger, annular piston to close the jaws on a workpiece after which it is automatically connected to the inner, smaller piston to apply clamping pressure at an increased mechanical advantage. The axial bore is accessible on removal of the displaceable vise jaw or a liner therefor and is provided with a filling opening for the fluid chamber of the cylinder, a screw normally closing this filling opening and forming a plug therefor. A pressure indicator visible through a port in the clamping body indicates the clamping pressure.

3,770,261

T-SLOT BOLT

Robert F. Anderson, 3613-13th St., Menominee, Mich. 49858

Filed Oct. 26, 1971, Ser. No. 192,176
Int. Cl. B23q *3/02*
U.S. Cl. 269—47 **4 Claims**



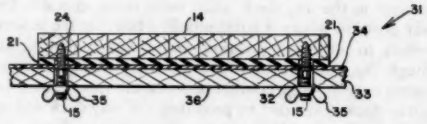
The present invention is to a T-slot bolt for use with set-up and hold-down tools employed with planers, shapers, milling machines and the like machine assemblies having a conventional T-slot containing worktable and is of a configuration such that the T-head member can be slipped into a mating T-slot of the worktable anywhere along its length.

3,770,262

KITCHEN CUTTING BOARD

George E. Bailey, Cordaville Rd., Ashland, Mass.

Filed Feb. 14, 1972, Ser. No. 226,002
Int. Cl. B23q *3/00*
U.S. Cl. 269—289 **11 Claims**



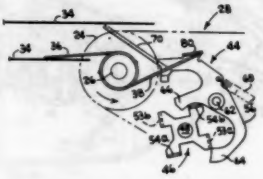
Disclosed is a cutting board having threaded studs that extend through holes in a kitchen counter and accommodate nuts that secure the board in place. A gasket positioned between the board and counter top prevents entry of foreign matter therebetween.

3,770,263

DEMAND FEED HOLD DOWN MEANS

Eriks Parups, Norwalk, Conn., and Joseph A. Conti, Whitestone, N.Y., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Dec. 6, 1971, Ser. No. 204,954
Int. Cl. B65h *39/00*, *9/08*
U.S. Cl. 270—58 **11 Claims**



The movements of several paired spring fingers from inoperative to operative positions are controlled by escapement

mechanisms acting in response to sensing fingers which sense the passage of the leading and trailing edges of each insert, incident to translating them in succession to an envelope loading station, whereat their trailing edges are in alignment. One spring finger of each pair is automatically released to move to its operative position and thus hold down the trailing edge of each insert upon arrival at the loading station, preparatory for engagement by the ram of an inserting machine acting to stuff the inserts into an envelope.

3,770,264

POSITION SENSING APPARATUS

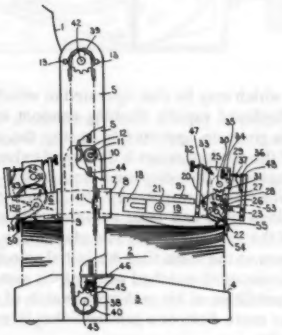
Geoffrey Wilfred Sturman, and Frederick Sinfield, both of Letchworth, England, assignors to International Computers Limited, London, England

Filed Dec. 10, 1970, Ser. No. 96,798

Claims priority, application Great Britain, Dec. 16, 1969, 61,153/69

Int. Cl. B65h *45/20*

U.S. Cl. 270—79 **4 Claims**



A paper stacker for stacking a continuous paper web in fanfold form from a printer is disclosed. Rollers having radially projecting resilient fingers engage both folded edges of the web as it is stacked. The rollers are each driven by a motor through a gear secured to the roller shaft. The motor is carried on a plate pivotted about the shaft the plate being held against rotation about the shaft by a spring. When the stack height brings the upper surface of the stack sufficiently close to the rollers the load on the rollers is sufficiently great to cause rotation of the plate against the tension of the spring, thereby making an electrical contact to actuate mechanism for raising the rollers.

3,770,265

CARD FEEDER

Giancarlo Gatti, Varese, Italy, assignor to Honeywell Information Systems Italia, Caluso, Italy

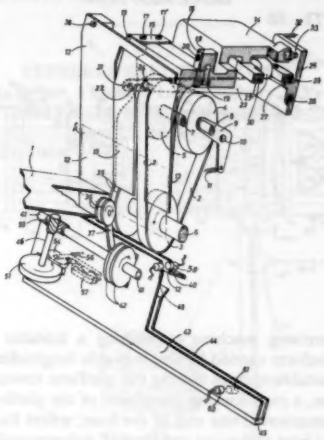
Filed June 14, 1971, Ser. No. 152,926

Claims priority, application Italy, June 20, 1970, 26312 A/70

Int. Cl. B65h *3/04, 5/06*

U.S. Cl. 271—10 **13 Claims**

A device for feeding and aligning cards for use with data handling systems is provided with a plate which supports a card stack and is moveable to initiate movement of the first card of the stack through a plurality of rotating members and



aligning bars which effect feeding and aligning of a card in asynchronous manner.

3,770,266

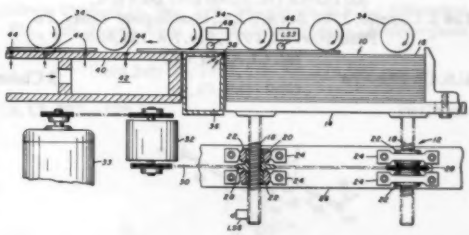
HANDLING SHEET MATERIAL

Robert L. Wehr, Harmony; Edward W. Rearick, Jr., Gibsonia, and Lemuel R. McBride, Zelienople, all of Pa., assignors to Billco Manufacturing Inc., Zelienople, Pa.

Filed Aug. 23, 1971, Ser. No. 173,906

Int. Cl. B65h *3/08*

U.S. Cl. 271—97 **2 Claims**



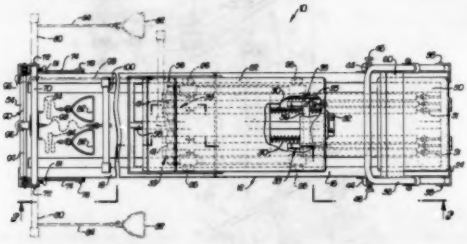
A method and apparatus for handling sheet material, such as glass sheets, is disclosed. A stack of sheet material is supported for movement in a generally upward direction towards driven friction rollers. The top sheet of the stack is separated from the next underlying sheet by a jet of fluid, such as air, coming from a nozzle arranged outside one of the edges of the top sheet. The jet of fluid is directed such that the edge of the top sheet will move upwardly and fluid will then flow between the two sheets to raise the top sheet upwardly until it engages the rollers. The top sheet is then transported by the rollers while riding on the cushion of fluid. Control means are provided for moving the stack of sheet material to position the top sheet of the stack for separation by the jet of fluid.

3,770,267

EXERCISING MACHINE HAVING PLURAL EXERCISING IMPLEMENTS THEREON

Marion S. McCarthy, 11213 Franklin Ave., Culver City, Calif.

Filed Mar. 8, 1972, Ser. No. 232,827
Int. Cl. A63b 21/00
U.S. Cl. 272—58 6 Claims



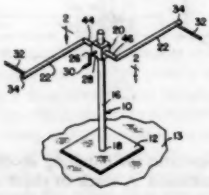
An exercising machine comprising a foldable elongated base, a platform carried by and movable longitudinally of the base, adjustable springs biasing the platform toward one end of the base, a stop limiting movement of the platform toward the aforementioned one end of the base, a first foot rest carried by the base at the one end thereof, a downwardly foldable frame on the base adjacent the one end thereof, and a second foot rest carried by the frame at a level above the first foot rest and between the first foot rest and the opposite end of the base. Another downwardly foldable frame is carried by the base adjacent this opposite end thereof, this frame carrying exercising implements engageable by the hands or feet of a user on the platform. Certain of these exercising implements comprise stirrups connected by chains to laterally spaced, horizontal arms on the frame, such arms being pivotable about vertical axes between positions wherein they extend laterally inwardly toward each other and positions where they extend laterally outwardly away from each other. One of the exercising implements mentioned includes a transverse rod carried by the frame, a pulley movable laterally along the rod, a chain connected to the pulley and a handle connected to the chain, the rod being carried by an auxiliary frame pivotable between upper and lower positions.

3,770,268

AUTOMATIC JUMPING DEVICE

Leo J. Castello, 3702 Burnett Ln., Huntingdon Valley, Pa.

Filed Mar. 22, 1971, Ser. No. 126,659
Int. Cl. A63b 5/22
U.S. Cl. 272—74 2 Claims



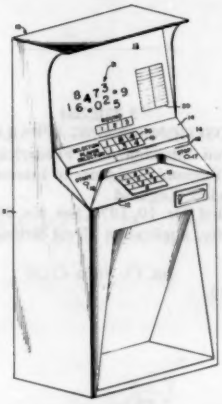
An automatic jumping device including a freestanding, vertical support which terminates downwardly in a portable base and within which is journalled a jumping arm crank at the upper end thereof. A jumping arm is operatively connected to the crank and includes a generally horizontal strut near one end thereof which is positioned to sweep close to the ground upon each revolution the jumping arm. The jumping device may be powered either manually or mechanically to rotate the jumping arm about the support to provide horizontal strut rotation of a uniform rotative speed for jumping purposes.

3,770,269

RANDOM UNIT GENERATOR AMUSEMENT DEVICE

Clarence L. Elder, 916 E. North Ave., Baltimore, Md.

Continuation-in-part of Ser. No. 737,466, June 17, 1968, Pat. No. 3,556,531. This application Jan. 18, 1971, Ser. No. 107,281
Int. Cl. A63b 71/06
U.S. Cl. 273—1 E 6 Claims



A game which may be disk operated in which the player observes a displayed rapidly flashing random series of indicia units and is given an opportunity to stop the machine so that one unit of the random series is displayed to hopefully match a player preselected and displayed unit of the random series. The machine, if not stopped by the player, continues for a predetermined time and then automatically stops to display one unit of the random series. The player may make succeeding selections at the same time his initial selection is made increasing his return if matched while at the same time decreasing the possibilities of his making a match of the total selection. One or more disks or a printed ticket is issued to the successful player.

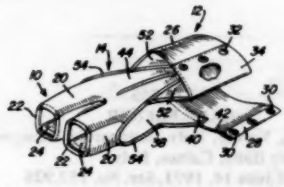
In a modification of the basic game in addition to a multiple selection from the random series the player also selects a horse from the horses of a simulated horse race in which the finished position of the horses is randomly determined. The players selection is then determined from the finish position of the selected horse.

3,770,270

BOWLING AID GLOVE

Torrence D. Ingold, P.O. Box 182, Albany, Ga.

Filed Nov. 2, 1971, Ser. No. 194,939
Int. Cl. A63b 71/14
U.S. Cl. 273—54 B 1 Claim



A bowling aid glove comprising individual finger stalls for the two middle fingers, an elastic snug-fitting wrist brace, and complemental oriented straps connecting the finger stalls with

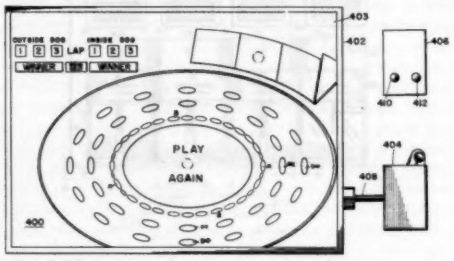
the wrist brace and comfortably harnessing the finger stalls in place. Each finger stall is equipped on the interior palmar side with a built-in firm but compressibly resilient pad. These pads are interposed between the fingers and coordinating surface of the ball and function as ball handling lifts. These lifts allow the overall hand to conformingly contour itself to the shape of the ball with the result that an improved grip permits controllable and releasable dexterity of action to be achieved.

3,770,271

ANIMATED DISPLAY AMUSEMENT DEVICE

Byoung Woon Kim, Philadelphia, Pa., assignor to Electronic Sensing Products, Inc., Hatboro, Pa.

Filed Sept. 25, 1972, Ser. No. 289,492
Int. Cl. A63f 9/14
U.S. Cl. 273—86 R **8 Claims**



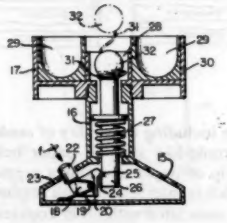
An animated amusement game having a board on which there is displayed a pair of dogs individually and sequentially advancing around the track. A rabbit is displayed as constantly circling the track and passing the dogs disposed thereon. A radio transmitter provides a multiplexed signal to electronic circuitry for controlling the individual advancement of the dogs in response to player actuated buttons on the transmitter which are associated with the respective dogs. Each dog advances a maximum distance if the player actuated button associated therewith is released at the moment that the rabbit passes the dog.

3,770,272

TETHERED BALL PROPELLING APPARATUS, TARGETS, AND SCORING MARKERS

Gabriel Olivier, 4 Chemin du Platane 1008, Vaud, Prilly, Switzerland

Filed Dec. 30, 1971, Ser. No. 214,280
U.S. Cl. 273—97 R **5 Claims**



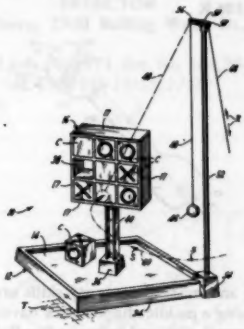
A game of skill consisting of a kit-box containing parallel rows of tracks each with a numbered scale thereon, a detachable marker for each track and a separable propelling device operated by the player and comprising a bowl mounted on a support, said bowl provided with a cylindrical vertical passage and numbered holes, in the shape of cups, surrounding said passage, the propelling device consisting of a piston on the top of which is fixed an elastic band connected to a ball, which is required to fall into one of the cups when propelled by the piston set in action by the player, who, after his turn is over, moves the marker by the number of points equal to the number marked on that particular cup.

3,770,273

TETHERED BALL TIC TAC TOE

Lawrence L. Reiner, 1 Hickory Ln., Woodbury, N.Y.

Filed Feb. 22, 1972, Ser. No. 227,863
Int. Cl. A63b 7/02
U.S. Cl. 273—101 **20 Claims**



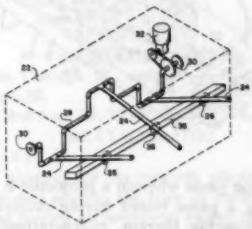
A game of skill which in one form simulates tic-tac-toe. The game includes a self-supporting frame for removably lodging a plurality of indicia-bearing playing cubes above a playing surface. A tethered striker ball is mounted above the playing surface and is adjustable in height with respect thereto for dislodging the playing cubes from the frame by impact-transfer between the striker ball and the playing cubes. Players, in turn, use the tethered ball to dislodge the playing cubes which are then reinserted into the frame, the object being the formation of a row or pattern of player-chosen indicia.

3,770,274

MOVABLE TARGET DESCRIBING AN OVAL PATH

Andrew Osak, P.O. Box 746, Showtown, U.S.A., Gibsonton, Fla., and Franz Alois Dunst, 1090 Vienna, Mullnergasse, Austria

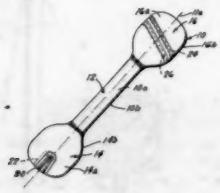
Filed July 25, 1972, Ser. No. 274,992
Int. Cl. F41j 9/00
U.S. Cl. 273—105.2 **10 Claims**



Apparatus for playing a game where the object of the game is to toss a ball through an opening in a moving target. The target is supported on one end of a rod and the other end of said rod is connected to a rotating crank shaft. The connection is a

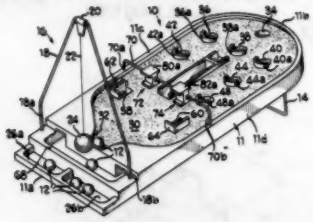
sliding bearing relationship, and a support intermediate the ends of the rod allow it to reciprocate as the crank shaft turns. The target is a face and the opening is the mouth in the face. The combination of the intermediate support and the rotating crank shaft allows the face to move in a roughly oval path in a vertical plane as the opposite end of the rod is moving in a circular path; and because of the reciprocation, the length of the lever arm between the crank shaft and the support is continuously changing.

3,770,275
AMUSEMENT AND EXERCISE DEVICE
Robert B. Moore, 113 Braemar Dr., Elk Grove Village, Ill.
Filed Feb. 3, 1972, Ser. No. 223,189
Int. Cl. A63b *65/00*
U.S. Cl. 273—106 R **7 Claims**



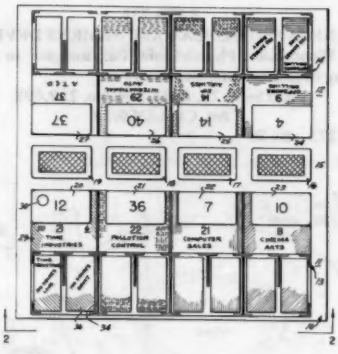
Amusement and manual dexterity skills are provided by a device comprising a paddle-shaped stick having a narrow central portion integral with and between two flat blade end portions that is gripped at one of the end portions by the user, flipped into the air where it rotates and twists, and caught by the user in accordance with predetermined rules. The device or stick has upper and lower sides of contrasting colors and each side includes indicia thereon to indicate a gripping point on one of the flat blade portions of each of the upper and lower sides whereby when the stick is gripped with the thumb at this point and flipped into the air twisting of the device will occur as it rotates.

3,770,276
PENDULUM-TYPE BAGATELLE GAME
Jeffrey D. Breslow, Chicago, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.
Filed Dec. 17, 1971, Ser. No. 209,161
Int. Cl. A63d *3/02, 13/00*
U.S. Cl. 273—119 R **9 Claims**



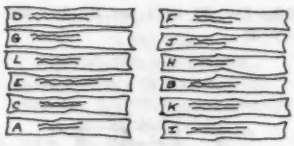
A bagatelle-type game wherein a projectile is launched for movement along a game board having receiving areas for retaining the projectile therein, characterized in that the launching means is a pendulum-type element and further characterized in that multiple hazard elements are positioned in the path of travel of the projectile and may be displaced between different positions to indicate a penalty to be assessed or a bonus to be given to the player, depending upon the relative disposition of the hazard elements, following engagement by the projectile.

3,770,277
STOCK MARKET GAME
Donald T. Cass, 29511 Jefferson, Apt. C-6, St. Clair Shores, Mich.
Filed June 27, 1972, Ser. No. 266,591
Int. Cl. A63b *63/10*
U.S. Cl. 273—135 C **3 Claims**



This invention relates to an improved game combining the features of a stock trading game having stock certificates, short transaction certificates, special envelopes for transactions prepared for easy handling of certificates, markers for arbitrage transactions, stock quotes and market condition cards, dice of different colors, and other apparatus resulting in an easy to learn and relatively uncomplicated means of transacting operations of the game without losing competitive challenge of playing the game.

3,770,278
COOKIE GAME
Irene Elma Mueller, 449 Cumnock Rd., Palatine, Ill.
Filed June 2, 1972, Ser. No. 259,020
Int. Cl. A63f *9/06*
U.S. Cl. 273—153 R **6 Claims**

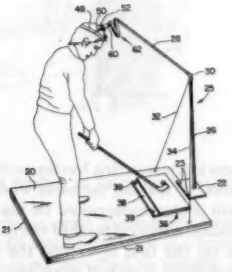


A cookie game including a plurality of cookies packaged as a set with a fortune-like strip of paper baked inside each cookie. Each strip of paper contains a segment of a written composition which is interrelated with segments on other fortune-like papers associated with other cookies in the package. When all the papers in the package are arranged side-by-side in a predetermined sequence they recreate the written composition. Each of the strips of paper bear a letter of the alphabet as an identifying mark. The letters are selected at random, and a separate piece of paper containing a key is included in the game. The key displays a sequence of the same letters displayed on the strips and hence is an instruction as to how to arrange the strips in the proper order to recreate the written composition.

3,770,279
GOLF PUTTER
Robert H. Phinny, R.R. 2, Fremont, Mich.
Filed Nov. 19, 1971, Ser. No. 201,598
Int. Cl. A63b *53/02, 53/04*
U.S. Cl. 273—167 G 7 Claims

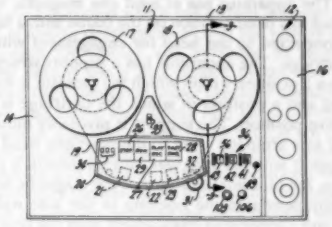
The head of a golf putter is substantially rectangular in shape and has a weight distributing channel formed in the top thereof which extends through one end of the putter head. Within the channel is mounted a shaft-receiving boss adapted to hold the shaft of the putter at an angle such that the putter can be held close to the feet of the user with the bottom surface of the putter parallel to the putting surface. The bottom of the putter head has an upwardly curved rear surface and the front and side walls are inwardly tapered from bottom to top. The weight distribution of the putter head together with the shaft angle allow the putter to be employed with a one-arm pendulum-type swing for improved putting accuracy.

3,770,280
GOLF TRAINING AND PRACTICE DEVICE
Herman A. Straus, P.O. Box 158, Norwich, Conn.
Filed July 5, 1972, Ser. No. 269,173
Int. Cl. A63b *69/36*
U.S. Cl. 273—183 B 12 Claims



A golf training and practice device for instructing a golfer to maintain his head in a fixed position during his golf swing is provided. The golf training and practice device comprises a headpiece for wear by a golfer using the training device, a support, and an electromagnet mounted on the support for releasably engaging a magnetic plate on the headpiece to hold the head of the golfer in a predetermined position and to indicate undesirable head movement during his golf swing. Either the magnetic plate or the electromagnet may be rotatably mounted to permit rotation of the golfer's head. Suitable electrical components may be provided so that (1) the electromagnet will be energized in response to the weight of a golf ball on a golf tee, and (2) the electromagnet will be de-energized upon displacement of the golf ball from the tee.

3,770,281
TAPE RECORDER WITH AUTOMATIC PROGRAM SELECTOR
Richard H. Walburn, 2930 Rolling Wood Dr., San Mateo, Calif.
Filed July 20, 1971, Ser. No. 164,254
Int. Cl. G11b *15/18, 27/20*
U.S. Cl. 274—4 D 6 Claims

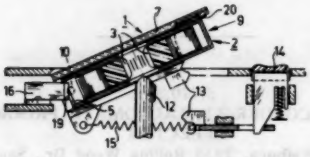


Tape recorder with built-in program selector for moving a tape to a predetermined point in either the forward or reverse direction and automatically recording or playing back program beginning at that point. The program selector includes a reversible multi-digit counter which is connected to the take-up reel through a reversible gear train. The gear train is arranged in such manner that the counter counts up when the tape moves at the normal speed in the forward direction and counts down when the tape either moves in the reverse direction or moves at the fast speed in the forward direction. When the counter counts down to a predetermined count, tape movement is interrupted, and the tape is transduced at the normal speed in the forward direction.

3,770,282
CASSETTE CHANGER
Allen L. Ryan, Chicago, Ill., assignor to Warwick Electronics Inc., Chicago, Ill.
Filed Aug. 31, 1971, Ser. No. 176,655
Int. Cl. G11b *27/22*
U.S. Cl. 274—4 F 2 Claims

A cassette changer for successively playing a plurality of tape cassettes and playing the tape in each cassette in two directions and having an improved power drive and cycling mechanism for causing index of cassettes and operation of the tape playing elements including a cycle mechanism brought into drive engagement with a continuously rotating drive element for cycling an actuating element movable between two limit positions which reverses the drive connections for the tape in a cassette and which in every other cycle of operation operates a main slide for causing an index operation for bringing a successive tape cassette into playing position.

3,770,283
RECORDING AND/OR PLAY-BACK APPARATUS
Lothar Jager, Vienna, Austria, assignor to U.S. Phillips Corporation, New York, N.Y.
Filed Jan. 21, 1971, Ser. No. 108,421
Claims priority, application Austria, Feb. 6, 1970, 1116
Int. Cl. G11b *5/48*
U.S. Cl. 274—4 E **4 Claims**

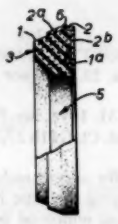


A recording and/or playback apparatus for recording and playing recordings on a tape-shaped record carrier accommodated within a box-shaped cartridge is provided. The cartridge is of the standard cassette type having a top, a bottom and four side walls with one of the side walls provided with at least one opening to accommodate therethrough a magnetic head. The apparatus has at least one magnetic head securely mounted in a fixed position on the frame with a tape guide surface connected to the head for engagement with the tape in the cartridge. The apparatus has a support structure movable between a position within which the cassette is loaded into the support and a position in which the cartridge is placed in an operative position. The support is pivotably mounted about a pivotal axis arranged close to the magnetic head so that when the support with the cartridge carried therein is pivoted about the axis, the tape guide surface of the magnetic head will automatically penetrate the opening in the side wall of the cartridge into cooperative engagement with the tape. At the same time a tape driving spindle mounted on the apparatus will simultaneously engage the tape carrying core of the cartridge for driving the tape.

ERRATUM

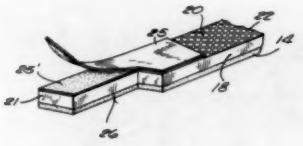
For Class 277—2 see:
Patent No. 3,770,179

3,770,284
SHAFT AND LINE SEALS
Peter Galloway, Whitley Bay, England, assignor to George Angus & Company Limited, Newcastle, England
Filed Sept. 9, 1968, Ser. No. 758,348
Int. Cl. F16j *15/38;* **B65d** *53/00*
U.S. Cl. 277—92 **1 Claim**



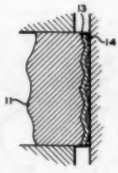
A shaft seal, of the face seal type, consists of a ring of microcellular polyurethane of which one end forms a holding portion, to fit on a shaft, and the other end provides a sealing face, of relatively small area, to be held against a sealed surface by the resilience of the ring itself, thus avoiding the need for a loading spring.

3,770,285
RING SEAL
Richard T. Grover, 8301 W. Edgerton Ave., Greendale, Wis.
Filed July 21, 1971, Ser. No. 164,647
Int. Cl. F16j *9/00*
U.S. Cl. 277—165 **4 Claims**



Actual sealing is done by a metal-filled Teflon polytetrafluoroethylene ring which in practice comprises about 40 per cent virgin Teflon mineral filled with about 60 per cent by weight powdered bronze or glass fiber. The Teflon in sheet form is bonded to a sheet of an elastomer such as synthetic rubber previously patterned on its compression surface to accommodate distortion occurring when the ring is installed. Along opposite margins of the composite sheet, double-coated tapes are applied, these being covered with liners. From the composite sheet, strips are slit or punched in dimensions to fit a grooved piston or the like. Preferably these strips are provided with step-joints cut at the ends of the strips which extend toward the margins to which the double-coated tape and liners have been applied. The rings thus formed are handled flat until applied in their respective grooves. At the time of application, the liner and/or tape is pulled from each ring end, leaving a thin coating of adhesive adhering to the ends of the ring adjacent the step-joint. When the ring is pushed into its groove, this adhesive engages the bottom of the groove and maintains the split ring in assembly with the grooved piston.

3,770,286
PISTON RING
Anthony G. Angilella, Centerville, and William P. Wallace, Hagerstown, both of Ind., assignors to Dana Corporation, Toledo, Ohio
Filed Mar. 11, 1971, Ser. No. 123,316
Int. Cl. F16j *15/00;* **C23b** *5/06*
U.S. Cl. 277—235 A **8 Claims**



Disclosed herein is a piston ring having an improved bearing surface and method of making the same wherein a first layer of hard chromium is electrodeposited on the bearing surface of a piston ring blank, a second layer of microcracked chromium is deposited on the first layer and the second layer of microcracked chromium is etched to provide a finely porous, friable surface, to eliminate the need for lapping of the ring and to promote break-in.

ERRATUM

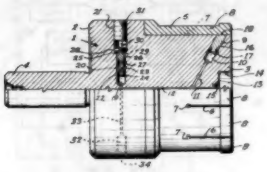
For Class 277—96 see:
Patent No. 3,770,181

3,770,287

HYDRAULICALLY CONTROLLED HOLDING DEVICE

Jonathan T. Weber; B. Warren Brofft, both of Cincinnati, Ohio, and Hugh J. Coyne, Covington, Ky., assignors to Positrol, Inc., Cincinnati, Ohio

Filed Jan. 13, 1972, Ser. No. 217,577
Int. Cl. B23b *31/30, 31/40*
U.S. Cl. 279—2 22 Claims



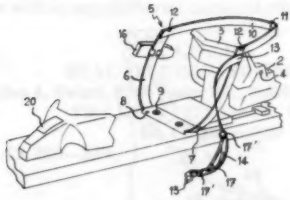
Hydraulically controlled holding devices for accurately locating and securely locking parts in position during the performance of various manufacturing and testing operations. The holding devices may be in the form of arbors or chucks and each comprises a body having at one end a segmented sleeve. The body contains a closed hydraulic system with a piston for each sleeve segment and an actuating means for the simultaneous operation of all of the segment pistons. Each segment is deformable by its respective piston so that the part will be engaged at the end of the holding device with equal pressure by all of the segments upon proper adjustment of the actuating means.

3,770,288

SAFETY STRAP SYSTEM FOR SKIS AND A METHOD OF ARRANGING SAME

Georges Pierre Joseph Salomon, 34 Avenue de Loverchy, Annecy-Haute-Savoie, France

Filed July 26, 1971, Ser. No. 165,996
Claims priority, application France, July 31, 1970, 7028424
Int. Cl. A63c *9/04*
U.S. Cl. 280—11.35 N 14 Claims



The invention relates to safety strap systems for skis and comprises:

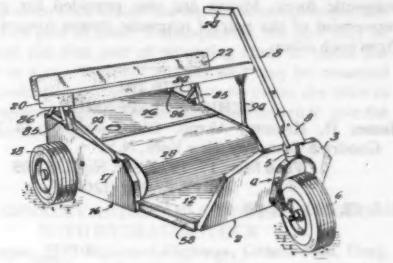
- a semi-rigid stirrup open towards the front of the ski and designed to fit around the back of a boot, the arms of the said stirrup being attached to upright, lateral wings attached to the ski;
- a flexible locking thong is attached to one arm of the stirrup and is adapted to be hooked to the other arm of the stirrup; and means are provided to ensure that, when the thong is unhooked, the stirrup will move far enough backwards, and will spread its arms far enough apart, to allow the boot to move freely when the ski is being put on or taken off.

3,770,289

COLLAPSIBLE VEHICLE

Lawrence W. Dougherty, 1516 W. St. James Pl., Arlington Heights, Ill., and Terence J. Gallagher, 83 Prospect St., Huntington, N.Y.

Division of Ser. No. 714,588, March 20, 1968, Pat. No. 3,589,745. This application Aug. 17, 1970, Ser. No. 64,581
Int. Cl. B62b *11/00*
U.S. Cl. 280—36 R 19 Claims



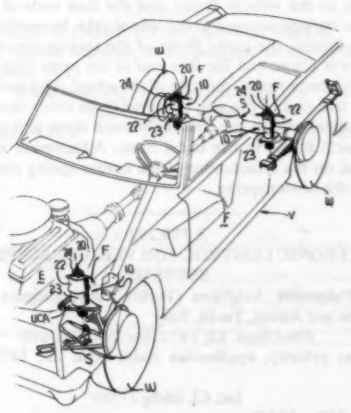
A vehicle collapsible to occupy a smaller volume for storage and transportation purposes which has a front and rear frame held together in sliding relationship so that the vehicle can be reduced in length for storage and extended in length for operation. The vehicle has a seat carried by the rear frame which includes a back support member pivotally movable with respect to the rear frame for folding into an out-of-the-way horizontal position. The rear wheels of the vehicle are carried by a suspension means which holds the wheels in alternative vertically extended and vertically retracted positions. Actuating means is provided for selectively moving the rear wheels to their retracted position by pivoting the back support member to its horizontal position, and for moving the rear wheels to their extended position by pivoting the back support member to its generally upright position. A steering bar is provided, which, when folded, also serves the purpose of retaining all folding parts of the vehicle in their folded positions.

3,770,290

VEHICLE SHOCK ABSORBER

Frank P. Bottalico, 4417 Fort Dr., Suitland, Md.

Filed Jan. 24, 1972, Ser. No. 220,180
Int. Cl. B62d *31/00*
U.S. Cl. 280—106.5 R 5 Claims



This disclosure relates to novel spring and/or shock absorbing means for an automotive vehicle or like suspension system,

the shock absorbing and/or spring means including a pair of magnetic means operable to normally maintain the vehicle frame and wheels in spaced relationship due to magnetic forces of repulsion, and means normally biasing the pair of magnetic means toward each other. The pair of magnetic means may be permanent magnets or electromagnets, and in the latter case the electrical system of the vehicle is the source of electromagnet energization which may be varied by a conventional slide wire or equivalent potential divider to vary the magnetic force. Means are also provided for guiding the movement of the pair of magnetic means toward and away from each other.

3,770,291

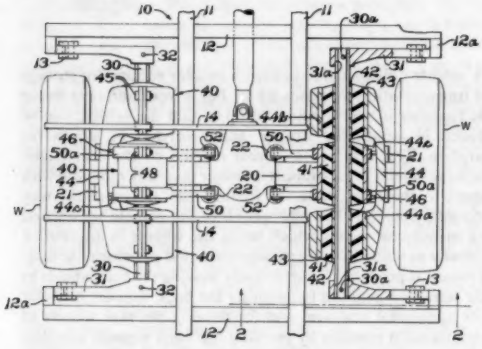
VEHICLE SUSPENSION

James H. Kramer, Akron, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

Filed Mar. 17, 1972, Ser. No. 235,505

Int. Cl. B60g *11/20*

U.S. Cl. 280—124 B **11 Claims**



A suspension of the type having the weight of the vehicle supported by torsion springs. A rigid shaft is disposed longitudinally of the vehicle adjacent each wheel. Three torsion springs are disposed in longitudinally spaced relationship about each shaft and each spring has an annulus of elastomer as the yieldable portion. Each spring has a rigid outer shell received over the elastomer annulus. A rigid arm is attached to the outer shell of the end springs to connect them resiliently in parallel. Additional arms are rigidly cantilevered from each end of each shaft. In one form of the suspension, the free ends of the arms from the shaft are pivotally connected through shackles to the vehicle frame and the free ends of the arms from the springs secured to the wheel axle. In another form of the suspension, the outer shells of the springs are secured to the vehicle frame and the free end of the arms from the shaft pivotally connected to the axle of the wheel. The center spring has the free end of the arm attached to its outer shell secured to the wheel axle in the first-mentioned form and secured to the vehicle frame in the latter form. Adjustment means are provided on the attachment of the center spring arm for preloading the center spring.

3,770,292

ELECTRONIC CONTROL FOR VEHICLE SUSPENSION SYSTEMS

Mario Palazzetti, Avigliana (Turin), Italy, assignor to FIAT Societa per Azioni, Turin, Italy

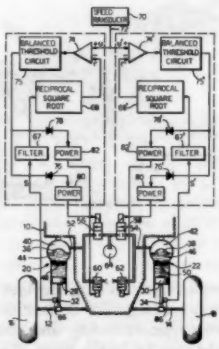
Filed Sept. 22, 1972, Ser. No. 291,478

Claims priority, application Italy, Sept. 25, 1971, 70164 A/71

Int. Cl. B60g *17/00*

U.S. Cl. 280—124 F **5 Claims**

Pneumatic fluid is discharged from or supplied to the pneumatic compartment of a hydropneumatic vehicle suspension depending on the sign of the difference between the vehicle speed and the reciprocal square root of the relative displacement between the suspension elements being positive or negative, so that the stiffness of the suspension is increased and reduced with increasing and decreasing speed of the vehicle. Alternatively, in a vehicle having purely hydraulic suspensions, transverse acceleration due to curves is sensed and used



to vary the amount of hydraulic fluid in the suspensions associated with individual wheels so as to vary the attitude of the sprung mass of the vehicle in order to compensate for the transverse inertial forces acting on the passengers. Transient vertical forces acting on the wheels due to unevenness of the driving surface are also used to vary the amount of fluid in the suspension so as to simulate the action of springs.

3,770,293

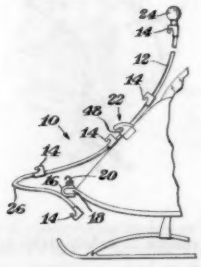
SAFETY ACCESSORY FOR SNOWMOBILES

Robert F. Anderson, 3613 13th St., Menominee, Mich.

Filed Mar. 17, 1971, Ser. No. 125,109

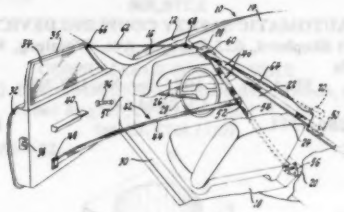
Int. Cl. B60r *19/00*

U.S. Cl. 280—150 R **10 Claims**



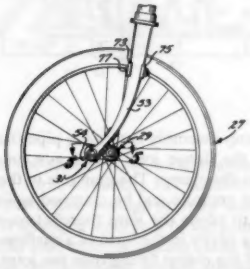
The invention is a wire cutter for permanent or removable attachment to the front of a snowmobile which comprises a plurality of hook-like snagging and shearing members mounted along a bar which conforms generally to the nose configuration of a snowmobile and extends upward from below the body of the snowmobile to at least about the height of an occupant of the vehicle. In operation, this safety attachment cuts wire strands of fences in the event a snowmobile encounters a fence during operation.

3,770,294
PASSIVE BELT ARRANGEMENT
Kenneth C. Hammer, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Oct. 26, 1971, Ser. No. 192,535
Int. Cl. B60r *21/02*
U.S. Cl. 280—150 SB 7 Claims



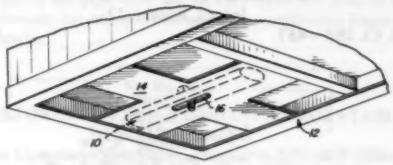
A passive belt arrangement for restraining a seated occupant of a vehicle body having a door movable between open and closed positions laterally adjacent the seat carrying the occupant. The belt arrangement includes lap and shoulder belts whose outboard ends are respectively secured to the door and to the vehicle body adjacent an upper outboard portion of the seat. The inboard ends of these belts are secured to one end of a control belt whose other end is received by a belt retractor mounted on the vehicle body floor inboard and adjacent a rear portion of the seat. The belt retractor normally retracts the control belt to position the lap and shoulder belts in occupant restraining positions. A control member slidably receives an intermediate portion of the shoulder belt and attaches respective ends of first and second cables. The first cable slides through a forward portion of the vehicle body roof and is attached to the door such that door opening movement pulls the control member forwardly as the shoulder belt slides through it and moves forwardly to an easy-enter position while the belt retractor extends the control belt. The inboard ends of the lap and shoulder belts move forwardly and upwardly as the forwardly moving shoulder belt extends the control belt under the impetus of the forwardly moving control member, the net effect being to move the lap belt forwardly to an easy-enter position concomitantly with the shoulder belt without any deliberate occupant effort. A cable retractor mechanism retracts the second cable during closing movement of the door to move the control member rearwardly and allow the belt retractor to retract the control belt and concomitantly move the lap and shoulder belts to the occupant restraining positions without any deliberate occupant effort.

3,770,295
DUAL AXLE CONVERTIBLE BIKE
Gordon A. Sword, 9246 Foster Rd., Bellflower, Calif.
Filed July 6, 1971, Ser. No. 159,711
Int. Cl. B62m *9/08*
U.S. Cl. 280—229 11 Claims



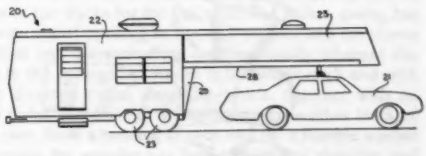
A dual axle convertible bike including a bike frame for being carried on one end from a wheel having a central axle which has a first pair of mounting studs projecting from the opposite sides thereof. An eccentric axle is mounted from the wheel and is spaced from the central axle and includes a second pair of mounting studs projecting from the opposite sides thereof. A wide spaced fork is carried from the frame and is formed with a pair of downwardly projecting tines which include bosses on their respective lower extremities for selective receipt on the first and second pair of mounting studs and which are spaced apart along their intermediate portions a distance sufficient to clear the respective first and second pairs of studs when such bosses are mounted on the respective second and first pair of studs. Consequently, the fork may be mounted from the first pair of mounting studs to cause the bike to ride in a conventional manner and may be mounted from the second pair of mounting studs to cause the bike to reciprocate upwardly and downwardly when ridden to give the rider a pleasurable ride.

3,770,296
LONGITUDINALLY ADJUSTABLE TRAILER KINGPIN WITH HYDRAULIC LOCK
Lloyd E. Logan, 3595 Redwood Highway, Grants Pass, Oreg.
Filed May 5, 1972, Ser. No. 250,810
Int. Cl. B62d *53/08*
U.S. Cl. 280—407 10 Claims



A kingpin assembly for a trailer has a kingpin mounted on a member arranged in a cavity of an enclosed, hollow, fluid-tight housing. The member is in substantially continuous peripherial contact with the housing for forming a piston. A slot in the housing permits movement of the member and kingpin parallel to the longitudinal direction of a trailer. A passage provided with a valve permits selective flow from one side of the member to the other of a fluid which fills the cavity and passage. When the valve is in a passage blocking position, the member will be locked in a predetermined position. Moving the valve to a passage opening position will permit the member and kingpin to be moved to another position.

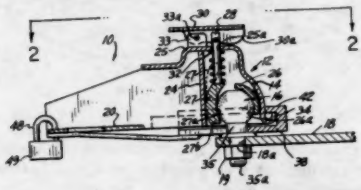
3,770,297
TRAVEL HOME WITH CAR-TOP HITCH
Robert G. Quick, Manlius, N.Y., assignor to Hy-Rider Inc., Trout Creek, N.Y.
Filed Nov. 18, 1971, Ser. No. 199,920
Int. Cl. B62d *53/06*
U.S. Cl. 280—423 R 3 Claims



A car-towed trailer has its foreportion segmented in three horizontally extending sections, the two lower sections being telescopically slideable up into the top section by hydraulic

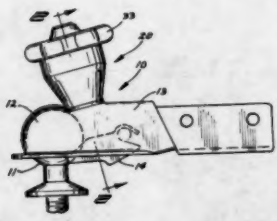
means so as to overlie the tow-car which has an ear at each side projecting up through the roof at the back of the driver's seat. The bottom telescoping section has a pendant hitch tube oscillatably secured thereto and rotatably secured to an underlying crossbar having a pair of forwardly projecting ears at each side adapted to extend along each side of a car-roof ear and be secured thereto by a clevis pin through the ears. The rear portion does not telescope and has wheels rearward of the foreportion spaced from the connected tow-car so that the tow-car can be driven forward or backed under the overlying foreportion. Support legs attached to the upper foreportion section may be folded up into hidden position at each side while traveling or folded down and hydraulically extended to support the foreportion when the tow-car is unhitched. The trailer-supported hitch crossbar has a pendant headed stud extending down through slots in one end of each of two forwardly extendable alignment arms whose forward ends carry pendant pins insertable in holes in a cross plate between the car-roof ears, the arm slots being of such length as to move the trailer foreportion transversely for guiding the ears into position when the car is moved toward the trailer.

3,770,298
TRAILER HITCH ANTI-BREAKWAY DEVICE
Floyd W. Phillips, 26274 McDonald St., Dearborn Heights, Mich.
Filed June 23, 1971, Ser. No. 155,875
Int. Cl. B60d *1/12*
U.S. Cl. 280—457 **5 Claims**



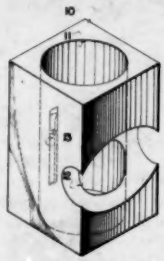
An anti-breakaway device for preventing the inadvertent vertical separation of a ball and socket type trailer hitch, having a downwardly opening ball receiving socket, and a draft ball attached to a draft vehicle and received in the socket, the device including interconnected locking plates which overlie portions of the hitch and underlie portions of the draft ball to restrict relative vertical movement of the ball and the socket.

3,770,299
LOCK FOR TRAILER HITCH COUPLER
Vincent H. Murphy, Richfield, Minn., assignor to Dempco, Inc., Minneapolis, Minn.
Filed Jan. 24, 1972, Ser. No. 220,355
Int. Cl. B60c *1/06*
U.S. Cl. 280—507 **16 Claims**



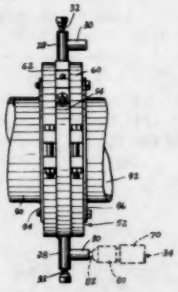
A lock for a trailer hitch coupler using a ball coupler assembly. A coupler bolt has a nut for tightening the coupler. The nut includes an outer drive member, and key lock means that is connected between the outer drive portion and an inner portion of the nut so that the outer drive portion may be made to spin free when desired to prevent releasing of the coupler bolt and theft of the trailer when it is either on or off the coupler ball.

3,770,300
AUTOMATIC SAFETY COUPLING DEVICE
Roy Earl Shepherd, 623 Rathgar Ave, Winnipeg, Manitoba, Canada
Filed Oct. 13, 1971, Ser. No. 188,759
Int. Cl. B60d *1/06*
U.S. Cl. 280—511 **12 Claims**



A drafthead carries a link pin vertically situated therein and held in the uppermost position by a paul. As a ball on a towing vehicle enters the drafthead, it disengages the paul and allows the link pin to drop over the ball by gravity. A guiding cone may be incorporated to assist in the engaging action which can occur at a variety of angular positions.

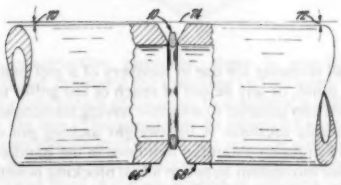
3,770,301
REPAIR FLANGE CLAMP
Harold R. Adams, R.R. 1, St. Francisville, Ill.
Filed May 8, 1972, Ser. No. 251,174
Int. Cl. F16l *55/10*
U.S. Cl. 285—15 **3 Claims**



A flange clamp assembly encircling pipe flanges for sealing all leakage at the flange joint and a gun for forcing sealant compound into the clamp. The clamp is in the form of a split ring adapted to encircle and be clamped against mating pipe flange fittings to cover the joint therebetween. The clamp is provided with a cavity in the form of a shallow annular groove in the inside of the clamp fitting over the joint and connected to an inlet sealant fitting for forcing sealant therethrough. The inlet fitting is bifurcated in the form of a Tee-fitting with a threaded inlet receiving a sealant gun. A bolt valve is adapted

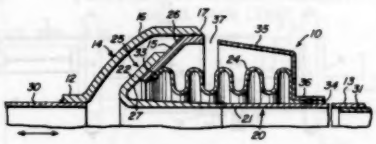
to pass through another opening of the Tee-fitting and open and close the sealant inlet. The sealant gun has an injector housing with an advancing screw adapted to be gripped by a wrench to force sealant through a threaded nozzel into the fitting. As a modification, the flange clamp may comprise three axially aligned rings to accommodate flanges of slightly different sizes with the middle ring being provided with the sealant cavity.

3,770,302
CONSUMABLE WELD INSERT
Emerson J. Hallenbeck, 2934 Shoreland Ave., Toledo, Ohio
Filed Aug. 13, 1971, Ser. No. 171,546
Int. Cl. F16l *13/02*
U.S. Cl. 285—22 **7 Claims**



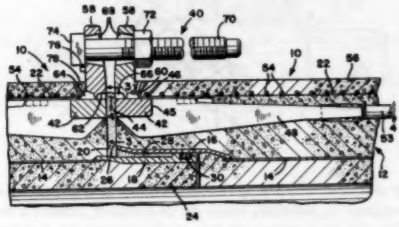
This invention relates to a consumable weld insert used in welding adjacent ends of pipe or tubing. The insert is of a unique wedge-shaped configuration, as viewed in transverse cross section, with the thickest portion being near the inner edge of the insert and the thinnest portion being at the outer edge. The inner edge of the insert is also rounded. The shape of the consumable weld insert helps maintain uniform heat distribution therein during welding and produces more uniform melting thereof. The shape also minimizes heat dissipation from the insert to the adjacent pipe ends so that the heat is concentrated in the insert. Additionally, the shape enables the welded, joined pipe to be straighter when the weld is completed.

3,770,303
FLEXIBLE JOINT FOR FLUID CONDUIT SYSTEMS
Tom E. Hallett, Newport Beach, Calif., assignor to Flexible Metal Hose Manufacturing Company, Costa Mesa, Calif.
Filed May 10, 1971, Ser. No. 141,515
Int. Cl. F16l *27/02*
U.S. Cl. 285—45 **8 Claims**



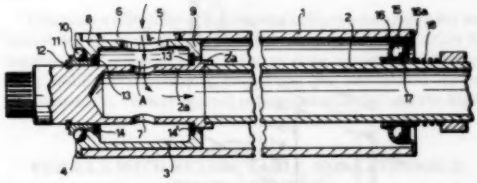
A flexible joint for tension fluid conduit systems providing angular flexibility while retaining full tension loads is provided. The joint has a zero leakage primary seal and a secondary seal which is arranged upstream of the primary seal. The secondary seal has load-bearing sealing faces which are isolated from external contaminants, are self lubricated to reduce bending moments during flexing movements, and the sealing faces of the secondary seal prevent the joint from being forced apart even with increased system pressures.

3,770,304
SUBAQUEOUS PIPE CONNECTOR
Lewis R. Keyser, Dayton, Ohio, assignor to Price Brothers Company, Dayton, Ohio
Filed May 3, 1972, Ser. No. 249,781
Int. Cl. F16l *11/12*
U.S. Cl. 285—45 **10 Claims**



Connectors for assembling prestressed, subaqueous pipe are embedded in the pipe in a manner such that the prestressing wire wrapping the pipe core can be carried to the ends of the pipe to obviate the necessity of utilizing reenforcing bands at the pipe ends.

3,770,305
DEVICE FOR CONVEYING FLUID INTO A ROTATABLE HOLLOW CASING
Domenico Camosso, Turin, Italy, assignor to RIV-SKF Officine di Villar Perosa S.p.A., Turin, Italy
Filed July 21, 1972, Ser. No. 273,910
Claims priority, application Italy, Aug. 3, 1971, 69612A/71
Int. Cl. F16l *17/00*
U.S. Cl. 285—110 **3 Claims**



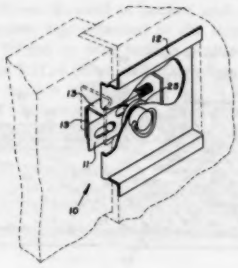
A device for conveying a fluid under high pressure to the interior of a hollow rotatable casing without losing fluid pressure is disclosed. The device comprises a fixed sleeve with respect to which the hollow casing is rotatable, there being a ball race at least at one end of the sleeve which is shaped, at that end, to form one of the tracks for the ball race. The hollow casing has at least one radial opening in the wall thereof and the sleeve has at least one corresponding opening axially adjacent the opening in the casing. The sleeve is formed at each end with inwardly directed radial shoulders which, together with an outward radial shoulder, or a ring forming the other track of the ball race, form a housing at each end for a flexible washer which covers the annular gap between inward shoulder and the ring or the outward shoulder. The flexibility of the washers allows them to press against the wall of the housing when the pressure increases due to the fluid flowing in under high pressure, and to seal the gap to prevent any loss of fluid or fluid pressure.

3,770,306

FIRE DOOR LOCK ASSEMBLY

James C. Nystrom, 5225 Evanswood Ln., Minneapolis, Minn.

Filed June 15, 1972, Ser. No. 263,144
Int. Cl. E05c *1/16*
U.S. Cl. 292—169 **3 Claims**



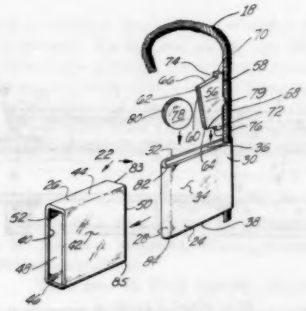
A fire door lock assembly having a slidable latching bolt which is retained in longitudinal and transverse disposition with minimum surface contacts so as to reduce harmful affects of corrosion which may result from humid or other mildly corrosive environments. The structure employs a guide channel for the latching bolt together with a spherical guide ball which is utilized to control the transverse disposition of the bolt within the guide channel. Means are provided for controllably moving the latch from locking disposition to open disposition.

3,770,307

CABLE LOCK AND SEAL DEVICE

James J. Van Gompel, Fremont, Ind., assignor to Brammall, Inc., Angola, Ind.

Filed Sept. 14, 1972, Ser. No. 289,121
Int. Cl. B65d *55/06*; **F16g** *11/04*
U.S. Cl. 292—307 R **6 Claims**



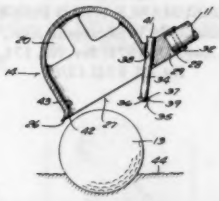
A cable lock and seal device which comprises a flexible cable and an enclosure fixedly secured to one end of the cable. A passage extends through the enclosure and is proportioned slidably to receive the distal end portion of the cable therethrough. A wedge element and a disk-shaped jam element are sealed within the enclosure, the wedge element including a ramp surface disposed at a small angle with respect to the passage and laterally spaced apart therefrom. The jam element is frictionally engaged between the ramp surface and cable portion whereby, movement of the cable through the passage in one direction causes movement of the jam element laterally away therefrom and movement of the cable in a direction opposite the aforementioned direction causes movement of the jam element laterally toward the cable to thereby jam the cable between the passage walls and the jam element so as to prevent further movement thereof in that direction.

3,770,308

GOLF BALL RETRIEVER

Saul L. Faber, Milwaukee, Wis., and Dennis J. Jurek, Santa Ana, Calif., assignor to Faber by said Jurek

Filed Apr. 7, 1971, Ser. No. 132,122
Int. Cl. A47f *13/06*
U.S. Cl. 294—19 A **9 Claims**



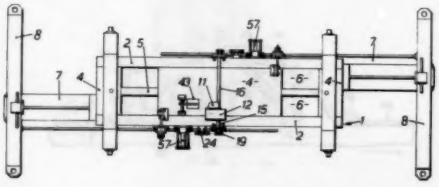
A golf ball retriever for use in recovery of a golf ball from a water trap, pond, or any lie out of reach of the golfer includes a bell-shaped cup secured to a handle having telescopically related, adjustable sections. A lightweight locking pin or tumbler is freely slideably mounted in a bore in the handle socket of the cup for movement between a ball blocking position partially spanning the mouth of a cup and a retracted position permitting entry of the ball into the cup. With the cup in an inverted operative position, light downward pressure on the cup causes the ball to cam the pin from the blocking position allowing entry of the ball into the cup. Once the ball has entered the cup, gravity action on the locking pin and the ball causes movement of the pin from the retracted position to a pin position partially across the cup to block egress of the ball from the cup.

3,770,309

MEANS FOR HANDLING FREIGHT CONTAINERS AND THE LIKE

Thomas Harry Merchant, Wolverhampton; Peter Thomas Ward, Lichfield, and Richard Terence, Wolverhampton, all of England, assignors to Rubery, Owen & Co. Limited, Darlaston, England

Filed Apr. 14, 1971, Ser. No. 134,014
Claims priority, application Great Britain, Apr. 21, 1970, 18,905/70; Sept. 19, 1970, 44,743/70
Int. Cl. B66c *1/00*
U.S. Cl. 294—81 SF **4 Claims**



A spreader frame for container handling equipment comprises a hollow box-like main frame and two parallel side-by-side booms which are movable in opposite directions. A chain is mounted lengthwise of each boom and meshes with a sprocket, both of which are driven from a common shaft to move both booms synchronously. A limit switch detector automatically controls the extension of the booms to a selected station and a wedge mechanism automatically locks the booms to the main frame at this station.

3,770,310

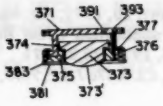
METHOD AND APPARATUS ACCOMMODATING PANEL CONSTRUCTION

Carl D. Russell, Tulsa, Okla., assignor to Aquarius, Inc., Tulsa, Okla.

Division of Ser. No. 94,100, Dec. 1, 1970, abandoned, which is a continuation-in-part of Ser. No. 56,833, July 21, 1970, abandoned. This application June 21, 1972, Ser. No. 263,928

Int. Cl. B66c *1/02*

U.S. Cl. 294—64 R **2 Claims**



For construction purposes, there is provided a novel method and apparatus for orienting and securing one panel to one or more panels of an array to comprise a wall, floor, ceiling or the like. The panel may be joined by contact adhesive along one longitudinal edge to the array or along two adjacent edges. In either event the apparatus insures fitting of the panel to the array prior ot the application of adhesive, withdraws the panel from the array along a predetermined path to a predetermined location for application of the adhesive, then contacts the panel edges to the array to distribute adhesive along the edges to be bonded and removes the panel to the predetermined position until the adhesive reaches its optimum setting point. Then all points of the edges to be bonded are cuased to contact simultaneously because the panel is moved along the predetermined path to its array position. One embodiment affixes panels in the vertical plane but brings them to the horizontal plane to facilitate the application of adhesive, and returns them for bonding without disturbing the final alignment. A modification of this embodiment enables tilting, angling, and skewing of the panel relative to a fixed floor or platform supporting the base of the machine to insure coplanar alignment of the panel to the array prior to bonding.

3,770,311

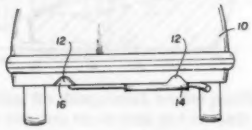
EXHAUST PORT COVERS

James Takayama, Los Angeles, Calif., assignor to The Raymond Lee Organization Inc., New York, N.Y.

Filed Feb. 9, 1972, Ser. No. 224,837

Int. Cl. B60k *13/00*

U.S. Cl. 296—1 R **1 Claim**



Plates provided with brackets and hooks can be detachable secured to the rear of the body of a Volkswagon automobile to cover the exhaust ports exposed when exhaust headers have been installed.

3,770,312

PICKUP TRUCK CAB WITH RETRACTABLE OR REMOVABLE REAR WINDOW

Whelchel Artis Shadburn, Placentia, Calif., assignor to Sparton Management Services, Inc., Placentia, Calif.

Filed Dec. 23, 1971, Ser. No. 211,621

Int. Cl. B60j *1/18*

U.S. Cl. 296—28 C **4 Claims**

A pickup truck cab having a rear window which is movable from a closed position to an open position, or removable, to provide a passageway between the interior of the cab and a camper, or the like, carried by the truck. The window is mounted for swinging movement into and out of its closed position and, when closed, the window is seated on a seal encompassing the window opening.

3,770,313

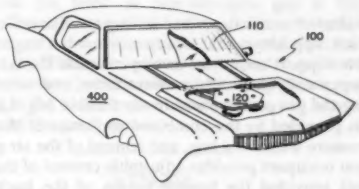
AUTOMOTIVE AUXILIARY WINDSHIELD

Narciso H. Jimenez, 508 51st St., West New York, N.J.

Filed June 2, 1970, Ser. No. 42,744

Int. Cl. B60j *1/20*

U.S. Cl. 296—95 C **5 Claims**



This is an extendible-retractable auxiliary windshield for automobiles to protect the vehicle against misappropriation by blanking the necessary means for viewing outside the automobile, while simultaneously protecting the windshield during non-use of the vehicle against inclement weather and the like.

3,770,314

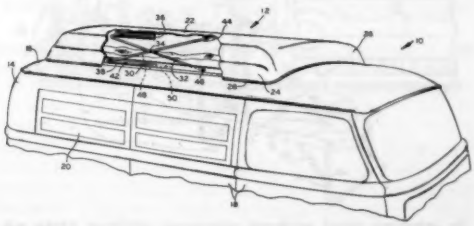
VEHICLE WITH RETRACTABLE AND EXTENSIBLE ROOF ASSEMBLY

Charles L. Borskey, P.O. Box 26, Andrews, Ind.

Filed Apr. 10, 1972, Ser. No. 242,532

Int. Cl. B60j *7/10*

U.S. Cl. 296—137 B **3 Claims**



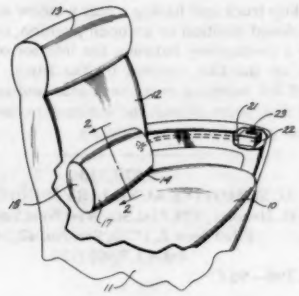
A vehicle with a retractable and extensible roof assembly comprising a ceiling for the vehicle having an opening formed

at one end thereof, a load-supporting horizontally slidable closure member adapted to cover the opening in the ceiling, a vertically movable roof portion over the ceiling, movable between a fully extended portion and a retractable portion having flexible sidewalls between the movable roof portion and the ceiling, and spring-biased means for aiding in the elevation of the roof to the fully extended position thereof.

3,770,315
SELECTIVELY ADJUSTABLE LUMBAR SUPPORT FOR AIRCRAFT SEATS AND THE LIKE

Darrell G. Smittle, Malibu, and Asbjorn Karlsen, Pacific Palisades, both of Calif., assignors to Hardman Aerospace, West Los Angeles, Calif.

Continuation of Ser. No. 78,709, Oct. 5, 1970. This application Dec. 18, 1972, Ser. No. 316,053
Int. Cl. A47c 27/18
U.S. Cl. 297—284 **8 Claims**

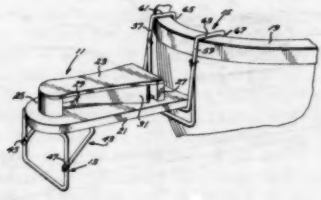


An aircraft seat is described having an adjustable support in the back opposite a seat occupant's lumbar region. The adjustable support comprises an impermeable flexible bag filled with open cell, elastically resilient foam, and means for controlling the gas pressure within the flexible bag. Lumbar support is provided by the combined resilience of the foam and air pressure within the bag, and control of the air pressure by the seat occupant provides adjustable control of the degree of support provided the lumbar region of the back. Pressure above ambient is created by load of a seat occupant's back against the bag and air is permitted to escape by way of a manually operated valve to obtain a selected condition. The bag is provided with an excess volume in order to prevent impact on the seat occupant's back in case of rapid decompression of an aircraft cabin.

3,770,316
COLLAPSIBLE FOOT STOOL

Warren T. Barkhuff, 3634 Cedar, Long Beach, Calif.

Filed July 18, 1972, Ser. No. 272,732
Int. Cl. A47c 9/12
U.S. Cl. 297—438 **9 Claims**

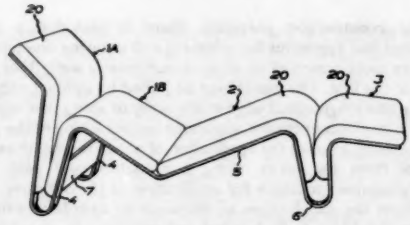


A collapsible foot stool including a foot rest having a leg pivotally connected to one extremity thereof and a hook pivotally connected to the opposite extremity thereof. The leg and hook are pivotable between retracted and supporting positions whereby such hook and leg may be pivoted to their retracted positions for storage and may, alternately, be pivoted to respective supporting positions with the leg arranged upright under the foot rest and the free extremity of the hook projecting upwardly to hook over a supporting edge such as the edge of a bathroom fixture.

3,770,317
SITTING FURNITURE

Eric Sigfrid Persson, Horby, and Signe Harriet Persson-Melin, Malmo, both of Sweden, assignors to Expo Nord AB, Horby, Sweden

Filed Nov. 30, 1971, Ser. No. 203,139
Claims priority, application Great Britain, May 10, 1971, 14,001/71; June 16, 1971, 28,260/71
Int. Cl. A47c 1/12, 7/00, 11/00
U.S. Cl. 297—445 **11 Claims**

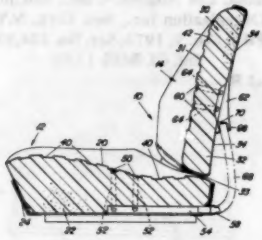


A piece of sitting furniture has front legs and rear legs and a back rest member which merges in a seat member and has an upper portion and a lower portion, said portions merging in one another by portions which in side elevation are of U-shape and constitute the rear legs of the furniture.

3,770,318
VEHICLE SEATS

Sydney Desmond Fenton, Lancashire, England, assignor to Storey Brothers and Company Limited, Lancaster, England

Filed July 28, 1972, Ser. No. 276,008
Claims priority, application Great Britain, July 29, 1971, 35,815/71
Int. Cl. A47c 7/74, 7/02, 7/54
U.S. Cl. 297—453 **11 Claims**



When vehicle seats are covered with a synthetic plastics material there are problems in hot weather because they do not soak up perspiration as would natural leather. On long journeys or on hot days, therefore, passengers clothes in contact with such seat coverings tend to become wet with perspiration. This is mitigated according to the invention by using

the seat cushion as a pump which expells air as it is depressed by the movements caused by the person sitting on the seat or vehicle movements and the expelled air is forced out through the front face of the back rest of the seat. Air is also sucked in through the top face of the seat cushion at times when the seat cushion becomes less depressed. In this way a flow of air is provided between the passenger and the seat which removes perspiration.

3,770,319

STOOL OF ELASTIC SHEET MATERIAL

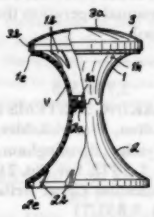
Taiichi Ono, 88-4-chome, Biwazima-dori, Nishi-ku, Nagoya-shi, Aichi-ken, Japan

Filed Jan. 27, 1972, Ser. No. 221,182

Claims priority, application Japan, Feb. 3, 1971, 46/4969; Feb. 15, 1971, 46/8188

Int. Cl. A47c *3/00, 9/12*

U.S. Cl. 297—461 **10 Claims**



A stool molded from elastically deformable synthetic resin has a generally mushroom-shaped hollow body closed at the top by an upwardly convex seat, the body being internally reinforced by ribs limiting its deformation under the weight of the user. A transverse partition at the waist of the body separates the interior thereof into an upper and a lower compartment, the upper compartment being provided with several small holes enabling the controlled escape of air under the weight of a user taking his seat.

3,770,320

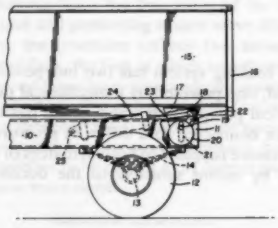
TILTABLE MOUNTING FOR DUMP TRUCK BODIES

Michael Bilas, 2730 Columbiana-New Castle Rd., New Springfield, Ohio

Filed Sept. 18, 1972, Ser. No. 290,172

Int. Cl. B60p *1/04*

U.S. Cl. 298—17 S **7 Claims**



A tiltable mounting for dump truck bodies positions a cylindrical member for rotation on its axis and mounts a shaft longitudinally of the cylindrical member and diagonally with respect thereto. Vertically slotted brackets cage the ends of the shaft beyond the ends of the cylindrical member so that rotation of the cylindrical member moves the shafts vertically in opposite upward and downward motion. The dump truck body is pivoted on said shafts and is thereby tiltable transversely relative to the wheel and axle assemblies of the dump truck.

3,770,321

LONGWALL MINING INSTALLATION WITH GUIDE COVER PLATES

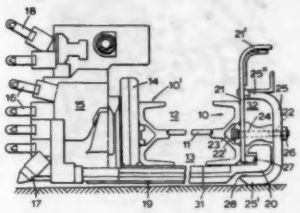
Alois Hauschopp, Langern, Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Westfalia, Germany

Filed Mar. 10, 1972, Ser. No. 233,426

Claims priority, application Germany, Mar. 23, 1971, P 21 14 034.1

Int. Cl. E21c *27/35*

U.S. Cl. 299—34 **5 Claims**



A mineral mining installation composed of a longwall conveyor with a plough guided on the mineral face side of the conveyor. The plough has a sword plate which extends beneath the conveyor and is attached to a drive chain guided in upper and lower guide channels formed at the other side of the conveyor. C-shaped cover plates are attached to the other side of the conveyor via spacers to laterally close off the channels and the lower flanges of the cover plates extend completely under the lower guide channel to seal off this channel from the floor. A laterally-open gap is formed between the lower flanges of the cover plates and the side of the conveyor and a reduced portion of the sword plate extends through this gap. The sword plate is connected to guide means guided in the lower channels and various components, such as bars welded to the lower end of barrier plates, can be used to cooperate with the guide means.

3,770,322

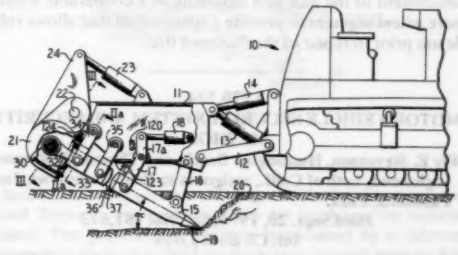
APPARATUS FOR FRACTURE OF MATERIAL IN SITU WITH STORED INERTIAL ENERGY

Delwin E. Cobb; Carl L. Kepner; Wayne E. Roberts, and Albert L. Woody, all of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 12, 1971, Ser. No. 133,262

Int. Cl. A01b *35/00*

U.S. Cl. 299—37 **41 Claims**



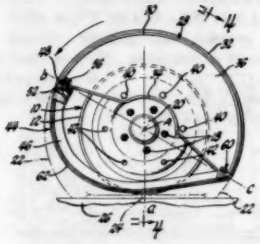
An earth working apparatus employs large amounts of stored energy which is cyclically delivered on demand to the work tool. The energy is stored in a large flywheel and delivered by suitable transmission means to the work tool.

3,770,323

VEHICLE JACK

Manfred A. Isaacson, Pontiac, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 14, 1971, Ser. No. 180,406
Int. Cl. B60b *11/00*
U.S. Cl. 301—38 R **5 Claims**



A vehicle jack includes a cam member adapted to be secured by a pair of nut and bolt arrangements to a first spare wheel segment mounted on a vehicle wheel housing carrying a flattened tire. The cam member mounts an elongated ground engaging friction member that extends circumferentially about the wheel housing axis with the configuration substantially of a logarithmic spiral for a predetermined circumferential angle. One end of the logarithmic spiral portion is positioned radially inward of the wheel housing to allow mounting of the jack without ground interference, while the other end is positioned adjacent the ground engaging surface of the first spare wheel segment. An initial rotational movement of the wheel housing moves the one end of the logarithmic spiral portion into ground engagement with a predetermined friction angle between the ground and a radius vector from the wheel housing axis to the point of ground engagement. During continued rotational movement of the wheel housing through the predetermined circumferential angle, the logarithmic spiral portion rolls along the ground and the jack lifts the wheel housing while the friction angle remains generally constant to minimize the maximum frictional force developed between the ground and the friction member. This minimization reduces the possibility of slippage between the friction member and the ground to ensure effective operation of the jack. Further rotational movement of the wheel housing moves the first spare wheel segment into ground engagement as the other end of the logarithmic spiral portion moves out of ground engagement, allowing detachment of the jack and mounting of a cooperable second spare wheel segment to provide a spare wheel that allows vehicle use prior to repair of the flattened tire.

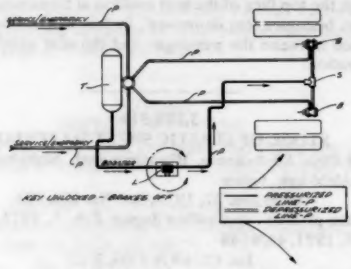
3,770,324

MOTOR VEHICLE SECURITY SYSTEM AND SECURITY METHOD

Billy E. Stevenson, Huntington Beach, and Thomas R. Rumsey, Inglewood, both of Calif., assignors to Royal Industries, Inc., Pasadena, Calif.

Filed Sept. 20, 1971, Ser. No. 181,673
Int. Cl. B60t *13/04*
U.S. Cl. 303—9 **7 Claims**

A motor vehicle security system for trucks, trailers and the like equipped with conventional fluid operated braking assemblies. The security system comprises a manually operable valve for controling the application of fluid under pressure to the braking assemblies to manually set the vehicle brakes. The valve is arranged with a mechanical, key-operated lock for controlling and locking the valve in a selected position. When the valve is a "locked" position it allows the brakes to be set and the vehicle maintained in situ to prevent the unauthorized



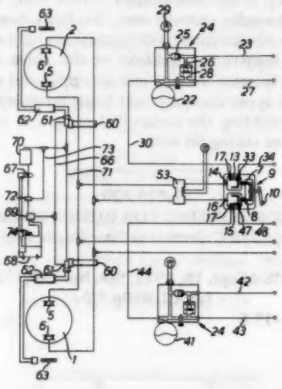
movement thereof. The brake assemblies are also secured and locked to prevent the manual operation thereof by means of a conventional lockout tool.

3,770,325

HYDRAULIC BRAKING SYSTEMS IN VEHICLES

Douglas Roy Spence, Olton, Warwickshire, England, assignor to Girling Limited, Tyseley, Birmingham, England

Filed Jan. 7, 1972, Ser. No. 216,211
Claims priority, application Great Britain, Jan. 15, 1971, 2,059/71; Mar. 2, 1971, 5,831/71
Int. Cl. B60t *13/16*
U.S. Cl. 303—10 **7 Claims**



A vehicle braking system has two independent sources of pressure fluid, one powered by a mechanical pump the other by an electrical pump. Each wheel brake has two actuators, each actuator connected to a different pressure source. The hydraulic pressure supplied to both actuators of a wheel brake is regulated by means sensitive to the deceleration of the wheel.

3,770,326

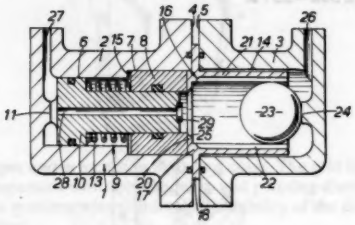
HYDRAULIC BRAKING SYSTEMS FOR VEHICLES

Hans Josef Vogt, Vallendar, Germany, assignor to Girling Limited, Birmingham, England

Filed Mar. 1, 1972, Ser. No. 230,749
Claims priority, application Great Britain, Mar. 19, 1971, 7,403/71
Int. Cl. B60f *15/02*
U.S. Cl. 303—6 C **4 Claims**

In a brake control unit for an hydraulic braking system a differential piston works in a stepped bore of complementary

outline, and an inertia-controlled valve member is adapted to engage with a seating in the end of the piston which is of smaller area to cut-off communication between an inlet and an outlet when the deceleration of a vehicle in which the unit is incorporated exceeds a predetermined value. A stop is in-



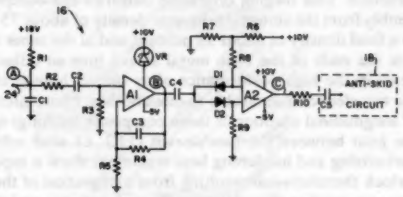
corporated to limit movement of the valve member with the piston in a direction towards the end of the bore which is of greater area when the seating is moved in that direction in response to an increase in fluid pressure at the inlet which acts on the end of the piston which is of smaller area.

3,770,327

WHEEL SPEED TRANSDUCER FREQUENCY DOUBLING CIRCUIT

Edgar J. Ruof, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 21, 1971, Ser. No. 136,027
Int. Cl. B60t *8/00*
U.S. Cl. 303—21 R **3 Claims**



A frequency doubling circuit in combination with an anti-skid control system is presented wherein the alternating current signal output of a wheel speed transducer is trasnformed into a signal having twice the frequency of the wheel speed transducer output and possessing square wave characteristics. Fundamentally, the invention utilizes two series connected operational amplifiers, the first of which transforms the output of the wheel speed transducer into a square wave of the same frequency as the alternating current signal. The second operational amplifier subsequently transforms the square wave into a signal of twice the square wave frequency by causing an operational amplifier to be pulsed at its output on each transition of the square wave signal.

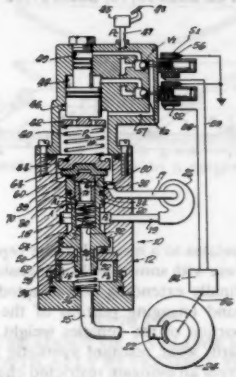
3,770,328

BRAKE CONTROL SYSTEM WITH FLOW CONTROL

Gordon W. Yarber, deceased, late of Malibu, Calif., by Anna Mildred Yarber, administratrix, 6070 Ramirez Canyon Rd., Malibu, Calif.

Division of Ser. No. 27,736, April 13, 1970, Pat. No. 3,704,047. This application May 12, 1972, Ser. No. 252,716
Int. Cl. B60t *15/04*, *8/02*
U.S. Cl. 303—21 F **11 Claims**

The invention provides more gradual and typically more linear response to an abrupt change of command force in a pressure regulating valve for brake control. The described structure is particularly useful in an anti-skid brake control system. A flow limiting orifice is inserted between the control valve and the output, and the hydrostatic force for balancing



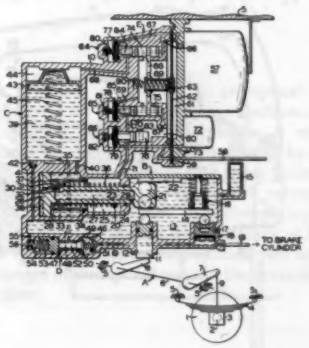
the applied command force is developed in part directly from the pressure at the output and in part from the pressure in the space between the control valve and the orifice. The effective size of the flow limiting orifice is preferably variable directly with the degree of opening of the control valve.

3,770,329

BRAKE CONTROL APPARATUS

Yasunosuke Oshida; Seisho Okamoto, and Ei Ichi Shinomiya, all of Kobe, Japan, assignors to The Nippon Air Brake Co., Ltd., Kobe, Japan

Filed Sept. 18, 1972, Ser. No. 290,216
Int. Cl. B60t *8/18*
U.S. Cl. 303—22 R **13 Claims**



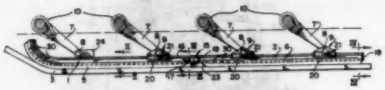
Brake control apparatus utilizing vehicle weight or gravitational force as the primary force for applying the vehicle brakes. The gravitational force is transmitted by a fulcrum lever acting through a fluid medium, the moment arms or fulcrum point of said lever, and therefore the force delivered thereby, being variable according to the deflection of the vehicle springs reflecting the vehicle weight and its load, as well as the effect of vertical oscillations of the wheels during movement of the vehicle over a running surface, thereby controlling the degree of brake shoe pressure on the wheels according to the effective friction of the wheels with the running surface.

3,770,330

WEAR BLADE FOR SNOWMOBILE SKID SUSPENSION

Emile Bombardier, Lawrenceville, Quebec, Canada, assignor to Bombardier Limited, Valcourt, Quebec, Canada

Filed Feb. 14, 1972, Ser. No. 225,771
Int. Cl. B62d 55/10; B62m 27/02
U.S. Cl. 305—24 5 Claims



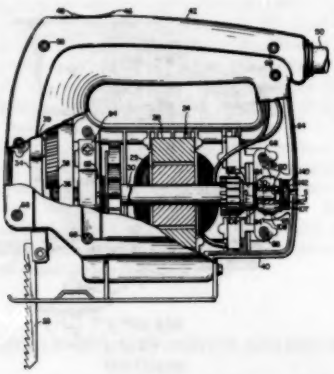
This invention relates to a novel elongate replaceable wear blade suitable for use with snowmobile suspensions of the type having a longitudinally extending skid adapted to resiliently apply to the ground engaging portion of the snowmobiles track at least a portion of the vehicles weight. The blade is formed from a hard, wear resistant synthetic resin and has along one side thereof an elongate restricted channel opening. The channel is adapted to be slidingly engaged and retained by complementary means on the skid. Abutment means are provided on the skids to hold the blades in a fixed position relative to the skids.

3,770,331

COMBINATION BEARING SEAT FOR MOTORS

Jerry W. Sellers, and Robert W. Taylor, both of Jackson, Tenn., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Sept. 2, 1971, Ser. No. 177,888
Int. Cl. F16c 35/00
U.S. Cl. 308—72 15 Claims



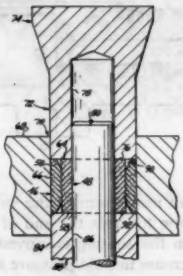
A combination bearing seat structure for supporting a motor shaft-journalling bearing having either a cylindrical bearing seat-engaging surface or a segmental spherical bearing seat-engaging surface. The combination bearing seat structure has two axially spaced apart segmental spherically contoured seats and an intermediate cylindrically coutour seat. The cylindrically coutoured seat provides the support surface for the cylindrical bearing, and the spherically contoured seats provide the support surfaces for the spherically contoured bearing.

3,770,332

COMPOSITE HEAVY-DUTY BUSHING AND METHOD OF MAKING THE SAME

William M. Dunn, Farmington, Mich., assignor to Federal-Mogul Corporation, Southfield, Mich.

Filed June 14, 1971, Ser. No. 152,860
Int. Cl. F16c 33/12, 33/14
U.S. Cl. 308—237 R 4 Claims



A composite heavy-duty bushing, such as a bearing bushing or bearing race (FIG. 4) consists of a high load-bearing or working portion consisting of a sleeve composed of sintered powdered high-performance alloy and a supporting or mounting sleeve subjected to less concentrated or intense loads made of an inexpensive base metal, such as sintered powdered iron. These two sleeves are separately briquetted, and then assembled telescopically. This assembly is then sintered while the sleeves are thus united, and finally hot-forged in an axial direction. This forging operation densifies the composite assembly from the sintered briquette density of about 75 percent to a final density of about 98 percent and at the same time upsets the ends of the base metal sleeve into an adjacent end bevel in the high performance alloy sleeve, hereby clinching the two sleeves inseparably to one another. Photomicrographs of longitudinal sections of these composite bushings spanning the joint between the two sleeves (FIG. 6) after subsequent carburizing and hardening heat treatment show a superior interlock therebetween resulting from a migration of the metals into one another across the interface therebetween into an intermediate zone of the intermingled metals which encircles the interphase. Torsion tests performed on such sections show adequate strengths without failure along the junction surfaces which compare favorably with the strength of similar single solid metal bushings. These photomicrographs also show that such a complete bond has been achieved along the central or axial portion of the joint, that the beveling of the ends is not essential in order to form a joint of adequate strength. Such beveling at the ends is therefore optional and is provided as an additional means of retention of the inner sleeve inside the outer sleeve.

3,770,333

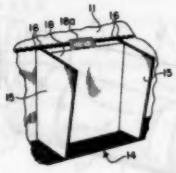
FILING CABINET CONSTRUCTION

Patrick J. Cusker, 5 W. Grand Ave., Fox Lake, Ill.

Filed May 15, 1972, Ser. No. 253,246
Int. Cl. A47b 63/00
U.S. Cl. 312—183 7 Claims

A filing cabinet construction of a longitudinally extending bin type arrangement supported above the floor and with an open mesh or grid bottom for supporting the contents and providing substantially universal adjustment of stationary and pivoting filing compartment and filing material dividers. The mesh or grid bottom is additionally effectively self-cleaning, and cooperates with certain contents dividers having depending projections to provide maximum adjustability or lateral

spacing of the dividers in the cabinet and maximum pivoting thereof for easy, rapid and convenient access to the contents, particularly when the contents are relatively large sheets such



as newspaper and advertising mats and copy. The grid bottom further cooperates with the stationary and pivoting dividers to provide for maximum longitudinal adjustability of the dividers in the cabinet.

3,770,334

COMBINATION DESK AND CHAIR

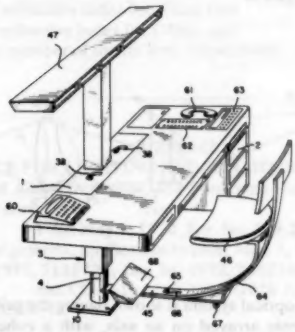
Reinold Weber, August-Siebert-Strasse 4, Frankfurt am Main, Germany

Filed Nov. 9, 1970, Ser. No. 87,780

Claims priority, application Germany, Nov. 8, 1969, P 19 56 364.5

Int. Cl. A47b *77/08, 53/00, 83/00*

U.S. Cl. 312—223 12 Claims



A desk top is rigidly secured to a vertically movable column constituting a hydraulic or pneumatic cylinder for a piston rising from the floor or depending from the ceiling. The piston is tubular and accommodates wiring and/or fluid pipes supplying electric or other equipment on the desk. A chair facing the desk top has a frame fastened to the piston or the cylinder. Receptacles, such as a waste basket and a file cabinet, are slidably received in rails on the underside of the desk top and are normally raised off the floor to facilitate sweeping, these receptacles being provided with casters for easy transportation to another location upon being lowered onto the floor and withdrawn from their rails.

3,770,335

COMPOSITE MAGNETIC MIRROR AND METHOD OF FORMING SAME

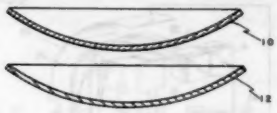
Steven C. Colburn, La Palma; Charles A. McPherson, Upland, and Roger A. Miller, Montclair, all of Calif., assignors to General Dynamics Corporation, Pomona, Calif.

Filed July 1, 1971, Ser. No. 158,818

Int. Cl. G02b *5/20*

U.S. Cl. 350—1 8 Claims

Disclosed is a composite magnetic mirror having a reflective surface deposited upon a glass-magnetic material composite. Also disclosed is the method for producing the composite by



fusing a preformed glass blank to a magnetic material substrate.

3,770,336

HARMONIC READOUT OF A VOLUME HOLOGRAM IN AN OPTICALLY REVERSIBLE MEDIUM

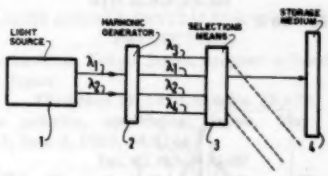
Dieter Roess, Planegg, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Dec. 30, 1971, Ser. No. 213,919

Claims priority, application Germany, Jan. 11, 1971, P 21 01 048.0

Int. Cl. G02b *27/00*

U.S. Cl. 350—3.5 7 Claims



The present invention is directed to an optical readout method and apparatus for utilizing a storage medium of reversible optical material on which information is recorded, preferably in the form of holograms, characterized by utilizing as a retrieval or reading light beam, a light beam having a harmonic frequency of the light beam utilized for recording the information on the storage medium. By utilizing a light beam for reading which is a harmonic of the frequency of the light beam used for recording, the reading process will not cause detrimental changes in the optical state of the reversible optical storage medium.

3,770,337

MASS SPECTROMETRY

Thomas Oliver Merren, Cheshire, England, assignor to Associated Electrical Industries Limited, London, England

Filed May 28, 1971, Ser. No. 148,114

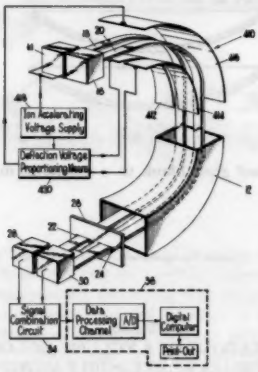
Claims priority, application Great Britain, June 17, 1970, 29,499/70

Int. Cl. B01d *59/44*; H01j *39/34*

U.S. Cl. 250—41.9 D 8 Claims

In a double-beam mass spectrometer, the two spectral out-

puts are given a small relative time displacement and superimposed without any peaks overlapping. Only a single data



processing channel is required with only a single analogue-to-digital converter for computer processing of the results.

3,770,338

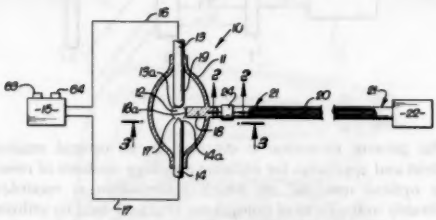
FIBER OPTICS LIGHT SOURCE

James G. Helmuth, Monrovia, Calif., assignor to Chadwick-Helmuth Electronics, Inc., Monrovia, Calif.

Filed Aug. 19, 1971, Ser. No. 172,976

Int. Cl. G02b *5/16*

U.S. Cl. 350—96 R **11 Claims**



A light source comprises an envelope; means including electrode structure to produce light at a zone within the envelope, electrode metal becoming vaporized in that zone; and light conducting rod means terminally facing within the envelope toward that zone and with sufficient closeness thereto to prevent vaporized metal deposition thereon.

3,770,339

SWITCH FOR FIBER-OPTIC TRANSMISSION SYSTEMS

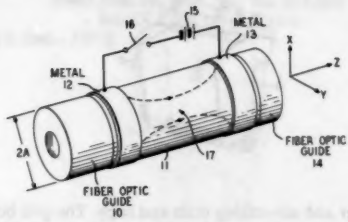
Vellayan Ramaswamy, Lincroft, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 6, 1972, Ser. No. 312,562

Int. Cl. G02f *1/34*; **G02b** *5/14*

U.S. Cl. 350—160 R **4 Claims**

An optical switch for fiber-optic light guides utilizes an electrically induced change in the index of refraction of the switch material to produce the switching effect. Electrode rings are spaced along a cylindrical member of electro-optic switch material, which is placed between two sections of a fiber-optic light guide. When a voltage is applied between the electrodes, an electric field is produced in the switch material causing a change in the index of refraction and the creation of a light



guide through the switch material. Removal of the voltage will destroy the guide in the switch material, thereby blocking transmission.

3,770,340

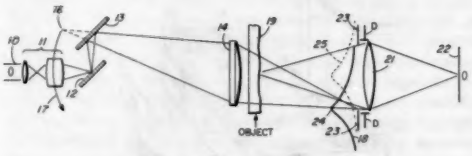
COHERENT OPTICAL SYSTEM WITH EXPANDED BANDWIDTH AND NOISE SUPPRESSION

David J. Cronin, Sudbury; Alward I. Pinard, Watertown, both of Mass., and Albert E. Smith, Riverside, Calif., assignors to Technical Operations, Incorporated, Burlington, Mass.

Filed Aug. 21, 1972, Ser. No. 282,395

Int. Cl. G02b *5/18*

U.S. Cl. 350—162 SF **17 Claims**



A coherent optical system is shown having the principal optical components arrayed on an axis, with a coherent light source effectively located off axis and arranged for effective rotation in a circular locus concentric with the axis. The dc term of the Fourier transform of an object that modulates light from the source is located off-axis in the Fourier transform plane and rotates about the axis so that an aperture stop in the transform plane which would pass the *n*-th order diffraction pattern where the dc term located on axis now passes the 2*n*-th order diffraction pattern thereby doubling the spatial frequency bandwidth of such coherent systems and enhancing resolution. At the same time, optical noise is reduced by averaging over the field.

3,770,341

TELESCOPIC LENS SYSTEM HAVING SMALL TELEPHOTO RATIO

Keiichi Itoh, Tokyo, Japan, assignor to Olympus Optical Company, Tokyo, Japan

Filed Feb. 22, 1972, Ser. No. 227,971

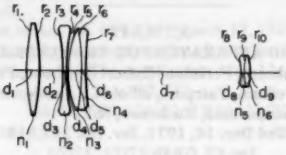
Claims priority, application Japan, Feb. 23, 1971, 46/8373

Int. Cl. G02b *9/34*, *13/02*

U.S. Cl. 350—220 **3 Claims**

A telescopic lens system having front and rear groups of lenses spaced apart one from the other by a large air space. The front group of lenses consists of a first biconvex lens, a second biconcave lens spaced apart from the first biconvex lens, a

third biconvex lens spaced apart from the second biconcave lens by a small air space and a fourth biconcave lens, the third



and fourth lenses being in contact or spaced apart by a small air space. The whole lens system is designed to satisfy the following five conditions

1. $f_{234} \leq -f$,
2. $-2f \leq r_3 \leq -0.4f$,
3. $0.03f \leq d_2 \leq 0.1f$,
4. $|n_3 - n_4| \leq 0.03$ and $\frac{\theta_4 - \theta_3}{\nu_4 - \nu_4} \leq 0.0015$, and
5. $n_1 \leq 1.55$ and $\nu_1 \geq 60$

where

f_{234} . . . the composite focal length of the second, third and fourth lenses,

f . . . the composite focal length of the whole lens system,

r_i, d_i, n_i, θ_i and ν_i (i=1,2,3, ...) . . . the radius of curvature of the ith lens, thickness of the ith lens or air spaced between the ith and (i+1)th lenses, refractive index, partial dispersion ratio ($ng-nF/nF-nc$) where

ng . . . refractive index for g-line

nF . . . refractive index for F-line and

nc . . . refractive index for C-line, and

Abbe's number of the ith lens, respectively.

3,770,342

DEVICE FOR LIGHTING AND EXAMINING A CAVITY

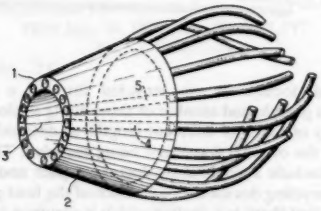
Raymond Andre Dudragne, 152 Boulevard Haussmann, Paris, 8E, France

Filed May 1, 1972, Ser. No. 249,238

Claims priority, application France, May 7, 1971, 7116725; May 7, 1971, 7116726; Jan. 24, 1972, 7202168

Int. Cl. A61b 3/10, 3/14; G02b 5/16

U.S. Cl. 351—7 **5 Claims**



A device for examining the inside of a cavity and, more particularly, for viewing or photographing the retina comprising a plurality of optical fibres cooperating with a light source, and an optical system forming an image of the cavity lit by the optical fibres.

In this device, the optical fibres are mounted along the generating lines of a frusto-conical support, with their transmitting ends distributed over the smaller base of the support, whereas the lens of the optical system are mounted within the support, at right angles to the axis thereof.

3,770,343

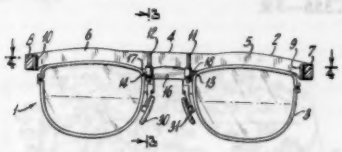
ADJUSTABLE BIFOCAL SPECTACLES

Alan A. Masucci, 1910 University Ave., New York, N.Y.

Filed Apr. 5, 1972, Ser. No. 241,331

Int. Cl. G02c 3/00

U.S. Cl. 351—55 **4 Claims**



Spectacles with adjustable lenses which include a frame with extended arms and bridge, thebridge having track means for holding a lens chassis capable of assuming a plurality of positions relative to frame. The len chassis includes a pair of lens and bridge structure supporting said lens, the bridge structure including a pair of spaced-apart support tubes for holding flexible nylon bushings disposed to fit within said tubes and sald track for movement along said tract relative to said frame. The lens chassis permits different viewing area of the lens to be exposed when the chassis is moved along said track.

3,770,344

LIGHT SOURCE SYSTEM FOR OVERHEAD PROJECTORS

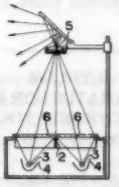
Yoshio Fukushima, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed May 19, 1970, Ser. No. 38,670

Claims priority, application Japan, May 20, 1969, 44/39062; June 3, 1969, 44/51662

Int. Cl. G03b 21/32

U.S. Cl. 353—38 **10 Claims**

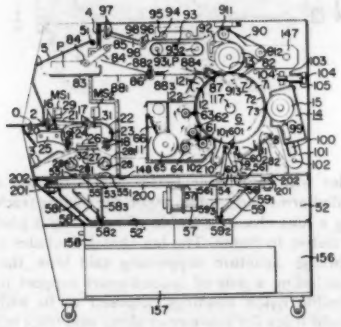


An illumination system for overhead projectors which maintains a high luminance of the image projected while keeping a low temperature in the lamp house enclosing the system, comprising a number of small light sources arranged in individual compartments with reflectors and each having an associated Fresnel lens, all of which lenses are arranged in a co-planar relation so as to concentrate the total light flux upon the projection lens. Alternatively, the small light sources may be replaced by reflecting mirrors and a single lamp used as the light source whose flux is collected and reflected by the mirrors, thus permitting a protective reflector to be used between the lamp and the lens system to minimize the size of the lamp housing.

3,770,345
ELECTROPHOTOGRAPHIC COPYING APPARATUS

Kazuo Kawakubo, Kawasaki; Motoharu Fujii, Tokyo, and Masao Ariga, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 17, 1970, Ser. No. 20,210
Claims priority, application Japan, Mar. 21, 1969, 44/21214; Apr. 16, 1969, 44/28971
Int. Cl. G03b 15/00
U.S. Cl. 355—3 R 46 Claims

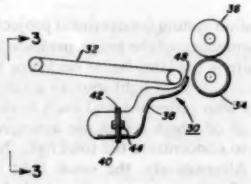


An electrophotographic copying apparatus having a photosensitive drum is provided with an assembly for feeding transfer material, an image transfer roller, and a fixing assembly all located upwardly of the drum, while a brush developer assembly, whole-surface exposure lamp, primary charging and contemporaneous secondary-charging exposure electrodes, and cleaning assembly are provided generally downwardly of the drum. The transfer roller and cleaning assembly are mounted on a movable frame structure which when moved away from a central frame structure permits access to and removal of the drum. A transport mechanism for an original has an adjustable path selector for recirculating an original upon insertion and expelling the original after the second traverse. The number of traverses is determined by a rotary cam. A dust-proof chamber encloses a completely independent optical assembly for projecting the image from the original onto the drum. The brush developer assembly has an adjustable cam controlled drive for a developer feed roller which supplies a fur brush transfer roller. The cleaning assembly includes a longitudinally fluted roller for wiping the drum and an axially oriented brush for cleaning the fluted roller.

3,770,346
METHOD AND APPARATUS FOR FUSER ASSEMBLY COOLING IN AN ELECTROSTATOGRAPHIC MACHINE

William E. Jordan, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 16, 1972, Ser. No. 235,117
Int. Cl. G03g 15/20
U.S. Cl. 355—3 7 Claims



An assembly is provided having elongated slot disposed about the vicinity of a fuser assembly including a fuser roller. The gaseous medium about such vicinity is caused to be vented to the atmosphere by passage through such assembly by activating a fan in fluid communication on the suction side thereof with the assembly.

3,770,347
METHOD AND APPARATUS FOR TRANSFERRING DATA

Walter R. Ambrose, Perinton; Robert T. Shone, Pittsford, and Brian H. Welham, Fairport, all of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

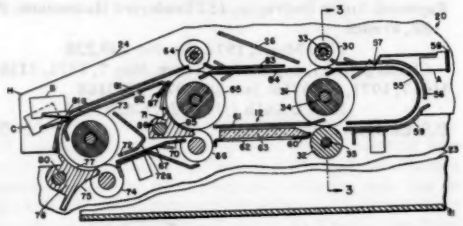
Filed Dec. 14, 1971, Ser. No. 207,818
Int. Cl. G03b 27/52, 27/70
U.S. Cl. 355—43 30 Claims

A cartographic means and method employs two or more compound microscopes having optical paths combined through semireflective means. One of the microscopes has means for receiving an input record in its object plane while the other has an output record in a horizontal object plane beneath its objective. Image modification means including a zoom system and preferably an image rotation mechanism and an anamorphic system are included in the input microscope system to permit the input image to be matched to the output image as both are viewed through the eyepieces. Various apparatus and methods for mounting, illuminating and scanning inputs, handling outputs, supporting the instrument, photographing the superimposed images and transferring data from input to output are described.

3,770,348
MULTIPLE COPY ARRANGEMENT FOR PHOTOCOPY MACHINE

Samuel W. Martin, Farmington, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Continuation-in-part of Ser. No. 750,912, Aug. 7, 1968, abandoned. This application Mar. 15, 1971, Ser. No. 124,329
Int. Cl. G03b 27/06
U.S. Cl. 355—102 5 Claims



Original documents are recycled through a photocopy machine a preselected number of times along a selected one of a plurality of paths of different lengths as determined by the length of the original document being recycled. The plurality of paths include a single copy document path and a first and second recycling document path. Each of the feed paths are so arranged that there is a portion which is common to the single copy feed path, the relatively long first recycling document path and the relatively short second recycling document path. The common portion is traversed along all of these paths by an original document regardless of which of the feed paths the original document initially or ultimately traverses, thereby necessitating only a single set or bank of control switches for controlling the several operating functions of the photocopy machine. Control apparatus which is located in the common portion is situated in advance of the illuminating station and guides are positioned for directing a document to be copied into the common portion prior to the document passing the control apparatus.

3,770,349

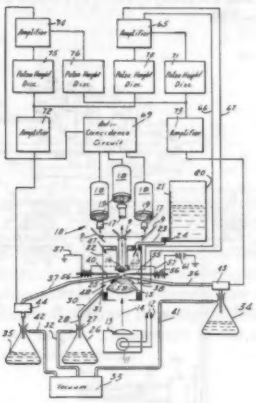
METHOD AND APPARATUS FOR AUTOMATICALLY CLASSIFYING COMPLEX, MICROSCOPIC PARTICLES SUCH AS HUMAN CELLS

Gilardo Legorreta-Sanchez, 13806 Hubbard Blvd., Los Angeles, Calif.

Division of Ser. No. 809,476, March 17, 1969, Pat. No. 3,675,768, which is a continuation of Ser. No. 435,377, Feb. 25, 1965, abandoned. This application May 12, 1971, Ser. No. 142,737

Int. Cl. G01n *21/00, 33/16, 15/02*

U.S. Cl. 356—73 14 Claims



Apparatus for classifying, counting and segregating microscopic particles such as cells. The particles may be contained in a gas or liquid and may be classified by measuring two characteristics thereof such as the size of the nucleus and the size or volume of the cell. This permits counting and separating of red blood corpuscules from leucocytes in the same solution. Normal and atypical cells may also be physically separated. The size of the nucleus may be measured by transmitted light and the size of the cell by scattered light.

3,770,350

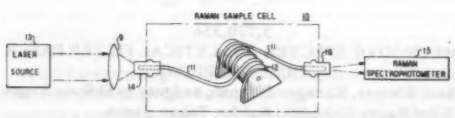
METHOD UTILIZING AN OPTICAL FIBER RAMAN CELL

Julian Stone, Rumson, and George Edouard Walrafen, Basking Ridge, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 24, 1972, Ser. No. 274,597

Int. Cl. G01j *3/44*

U.S. Cl. 356—75 5 Claims



A long length of liquid-core optical fiber is employed as a Raman cell, wherein the fiber core contains the material whose Raman spectrum is to be analyzed. Spectral intensifications of from 10^2 to 10^3 times greater than that obtained by conventional means are realized, using very small sample volumes. Optimum fiber lengths are disclosed.

3,770,351

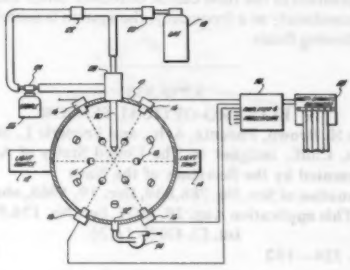
OPTICAL ANALYZER FOR MICROPARTICLES

Philip J. Wyatt, Santa Barbara, Calif., assignor to Science Spectrum, Inc., Santa Barbara, Calif.

Continuation of Ser. No. 777,837, Nov. 21, 1968. This application Nov. 23, 1971, Ser. No. 201,469The portion of the term of this patent subsequent to Nov. 30, 1988, has been disclaimed.

Int. Cl. G01n *15/02, 21/00*

U.S. Cl. 356—102 45 Claims



There is described a method and apparatus for identifying submicroscopic particles by directing the particles through a highly collimated beam of light and simultaneously measuring the light intensity at a plurality of different angles relative to the point where the particles move through the beam.

3,770,352

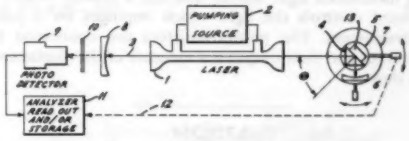
TOTALLY REFLECTING LASER REFRACTOMETER

Matthew B. White, Newport Beach, Calif., assignor to Philco-Ford Corporation, Philadelphia, Pa.

Filed May 8, 1972, Ser. No. 250,877

Int. Cl. G01n *21/46*

U.S. Cl. 356—133 10 Claims



A laser having isotropic polarization characteristics, is operated with a confocal mirror cavity and is adjusted in terms of mirror reflectivity, spacing, and laser active medium to operate at a particular wavelength. A total internal reflection prism is contained inside the laser optical cavity and is rotated to produce an optical path angle slightly greater than the critical angle. For this condition the prism will constrain the laser to oscillate in such a way that adjacent modes have orthogonal polarizations. In the case of two mode operation one mode will be polarized parallel to the plane of incidence at the prism reflecting surface and the other will be perpendicular to the first. The phase shifts produced upon total reflection are different for light polarized parallel and perpendicular to the plane of incidence. Futhermore the difference in the phase shifts for these two polarization directions is a function of the refractive indices of the prism and its facing material as well as the angle of incidence. Since the difference in phase shift is equivalent to a difference in optical cavity length for the two orthogonally polarized modes the frequency of one of the modes is slightly displaced with respect to the other. Measurement of the beat frequency difference between the orthogonal

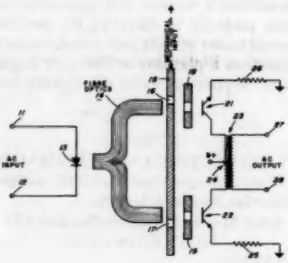
modes will therefore yield information on the refractive index of the facing material provided that prism index and angle of incidence are known.

In one embodiment the prism is provided with a calibrating sample of known refractive index placed in close contact with its reflecting face. The prism and laser cavity are then adjusted to produce a stable mode difference beat frequency. Very small changes in refractive index of the material in contact with the prism face can be correlated with changes in beat frequency thereby giving a very sensitive measure of refractive index. If the comparison sample is a fluid confined inside a chamber sealed to the prism face, extremely slight differences in composition of the fluid can be detected. Since the output is read immediately as a frequency, the system is useful in monitoring flowing fluids.

3,770,353
ELECTRO-OPTICAL SENSOR

Charles H. Brown, Phoenix, Ariz., and Frederic L. Miller, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Continuation of Ser. No. 786,839, Dec. 19, 1968, abandoned. This application Aug. 25, 1971, Ser. No. 174,918
Int. Cl. G01b *11/26*
U.S. Cl. 356—152 **10 Claims**

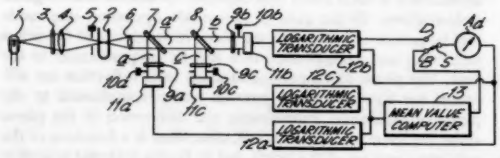


This invention is directed to an electro-optical sensor which can accurately measure small displacements. The sensor utilizes a modulated light source and has a shutter whose displacement controls the light which impinges on a pair of phototransistors. The phototransistors are connected to a transformer and their output is a measure of the displacement of the shutter.

3,770,354
PHOTOELECTRIC PHOTOMETER

Hisao Tsuruta, and Norihiko Kiyose, both of Kyoto, Japan, assignors to Yanagimoto Seisakusho Co., Ltd., Kyoto, Japan

Filed June 30, 1971, Ser. No. 158,444
Claims priority, application Japan, July 4, 1970, 45/58437
Int. Cl. G01j *3/46*; G01n *21/22*
U.S. Cl. 356—178 **2 Claims**

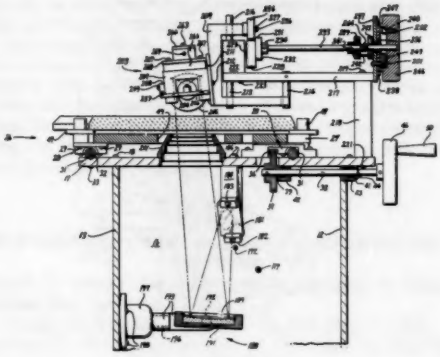


A photoelectric photometer for light absorption analysis in which a light beam passing through the sample cell is split into three beams of monochromatic light having different wavelengths which correspond to the wavelengths at the peak maximum, the beginning and the end of the absorption spectrum band due to the constituent contained in the sample, and the light energy of the wavelength exhibiting the peak maximum is compared with a mean value of the light energies of the other two wavelengths, whereby the absorption degree of the constituent of the sample to be determined is indicated for direct reading.

3,770,355
THICK WINDOW TRANSMISSION SPECTROPHOTOMETER AND METHOD

Erik W. Anthon, Santa Rosa, Calif., assignor to Optical Coating Laboratory, Inc., Santa Rosa, Calif.

Filed May 31, 1972, Ser. No. 258,318
Int. Cl. G01j *3/48, 3/42*; G01n *21/22*
U.S. Cl. 356—189 **27 Claims**



A spectrophotometer for ascertaining transmission of enery by a test piece and having a housing with a source of energy in the housing and means carried by the housing for forming an image limiting aperture. Optical means within the housing is provided for receiving energy from the source for forming a beam of energy and imaging the source in the aperture. Means is provided for chopping the beam. Filter means is provided for passing selected narrow spectral bands of energy in the beam. Optical means is provided for receiving energy passing through the aperture and includes collimating means and means for causing the beam to be tilted at an angle with respect to the test piece. Means including a detector is provided for receiving the beam after it has passed through the test piece.

In the method, a beam of energy is provided which is collimated and is offset at an angle with respect to the test piece so that back reflected energy is substantially eliminated and will not influence the tests being made on the test piece. Tests are made with and without the test piece in the beam.

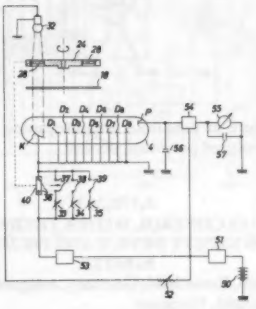
3,770,356
METHOD OF SPECTRA ANALYTICAL FILTER PAPER DUST SAMPLING

Kikuzi Kimura, Kanagawa, Japan, assignor to Shibata Kagaku Kikai Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed June 30, 1972, Ser. No. 267,934
Claims priority, application Japan, July 23, 1971, 46/54642
Int. Cl. G01n *21/12*
U.S. Cl. 356—207 **9 Claims**

A method of spectra analytical filter paper dust sampling is provided whereby air-borne or natural, industrial dust, such as dust deposited in a room, soot emitted from plant chimneys, dust in emissions from automobiles, or dust originating from foundries, is captured on a sampling filter such as filter paper;

the dust is exposed to an appropriate light of single short wave length; and by determining the optical density, the concentration of the air-borne dust can be determined using a prepared diagram showing the relationship between the air-borne dust and its optical density. Alternatively, each sample of air-borne dust collected on the sampling filter is exposed to a plurality of



lights of different wave lengths; and then by finding the ratio of optical densities as measured by a pair of lights, the content of a specific component in the air-borne dust can be determined using a prepared diagram showing the relation between the content of the specific component in the air-borne dust and the ratio of optical densities.

3,770,357

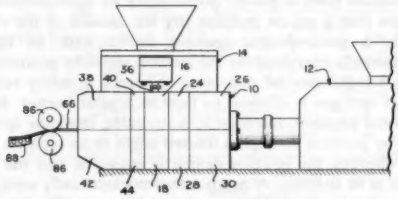
EXTRUSION DIE

Lloyd W. Gibney, Funkstown, Md., assignor to American Optical Corporation, Southbridge, Mass.

Continuation of Ser. No. 847,573, Aug. 5, 1969, abandoned. This application Nov. 15, 1971, Ser. No. 199,066

Int. Cl. B29f *3/12*

U.S. Cl. 425—131 **6 Claims**



A die for extruding varigated plastic sheet stock. The die is a multiple extrusion die having a main die structure which receives a supply of plastic material of one color and emits the varigated extrusion while a second die enclosed within the main die structure receives a plastic material of a second color along with the material of said one color and extrudes the two materials in the form of a multiplicity of alternate juxtapositioned strips into an extrusion orifice of the main die structure. Compression of the inner die extrudate taking place between die lips of the main structure blends the differently colored plastic materials together with retention of the general configuration of pattern produced by the inner die.

3,770,358

BISCUIT FORMING MACHINE

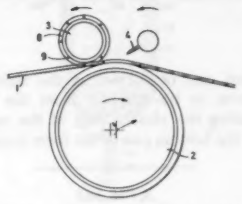
Gordon Steels, and Stanley Graham, both of Peterborough, England, assignors to Baker Perkins Limited, Peterborough, England

Filed Jan. 10, 1972, Ser. No. 216,498

Claims priority, application Great Britain, Jan. 14, 1971, 1,952/71

Int. Cl. A21c *11/04*

U.S. Cl. 425—291 **9 Claims**



A machine for forming repetitively impressioned dough sheets with transverse and longitudinal perforations for the manufacture of Soda Crackers wherein a continuous sheet of dough is impressed with the longitudinal and transverse perforations by a marking roll co-operating with a backing roll and the continuous sheet is cut by a knife rotating in phase with the marking roll along selected transverse rows of perforations by moving the backing row towards the knife at appropriate intervals.

3,770,359

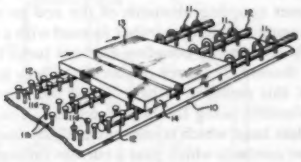
APPARATUS FOR THE MANUFACTURE OF HOOK FABRIC MATERIAL FOR FASTENERS

Hisashi Hamano, Soka, Japan, assignor to International Knitlock Corporation, New York, N.Y.

Division of Ser. No. 90,382, Nov. 17, 1970, Pat. No. 3,718,725. This application Sept. 25, 1972, Ser. No. 292,102

Int. Cl. B29c *17/14*

U.S. Cl. 425—305 **1 Claim**



Methods are disclosed including the use of heat and chemicals for converting loops upstanding from a base fabric into hook members suitable for use in hook and loop fasteners.

3,770,360

APPARATUS FOR STRIPPING SLAB CASTING FORMS

Theodore W. Shoe, Fletcher, Ohio, assignor to The Flexicore Co., Inc., Dayton, Ohio

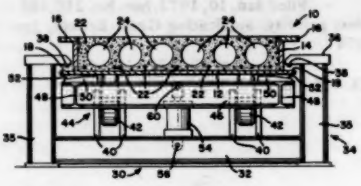
Filed Mar. 1, 1972, Ser. No. 230,831

Int. Cl. B28b *13/04*

U.S. Cl. 425—440 **7 Claims**

A method and apparatus for stripping slab casting forms from cured concrete slabs by flexing the forms to allow grout keyway forming protrusions projecting inwardly from the

form side walls to clear the associated grout keyways formed in the slab. By applying stripping forces to the form in a particular manner a more satisfactory grout keyway, from a structural view point, can be formed in the slab while still permitting the form to be stripped from the slab by flexing without exceeding the elastic limit of the material, such as steel, of which the bottom pan of the form is constructed.



3,770,361

THERMOFIXING APPARATUS FOR SYNTHETIC-RESIN SLIDE-FASTENER

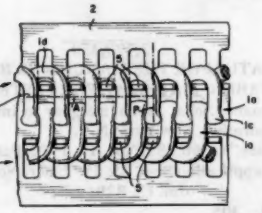
Helmut Heimberger, Grenzach, Germany, assignor to Opti-Holding AG, Glarus, Switzerland

Filed Feb. 16, 1971, Ser. No. 115,395

Claims priority, application Germany, Feb. 19, 1970, P 20 07 593.8

Int. Cl. B28b 11/00

U.S. Cl. 425—445 **9 Claims**



An apparatus for thermofixing continuous synthetic-resin slide-fastener coupling elements of the coil or meander type has an elongated shaping member formed with a series of beds that snugly receive the coupling-element turns to set or form the shape thereof. A source of electric energy is coupled to a portion of this member to heat it and thereby conductively heat the element along the heated portion. The member can be an endless band which is intermittently or continuously displaced over contacts which pass a current through it to heat it, or through a coil to heat it inductively. Downstream of the heating station the band is cooled, prior to detachment therefrom of the thermofixed coupling element. The contacts can comprise a pair of spaced-apart rollers connected to one side of the electric-power source and therebetween another contact connected to the other side of the source.

3,770,362

MOISTURE INDICATOR FOR PHOTOFLASH LAMP

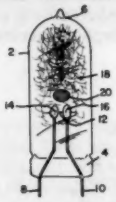
John W. Shaffer, Williamsport, Pa., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Filed Dec. 23, 1971, Ser. No. 211,450

Int. Cl. F23d 5/12

U.S. Cl. 431—13 **6 Claims**

A photoflash lamp having a moisture indicator comprising a spot of dried paste disposed on the inside surface of the hermetically sealed lamp envelope to indicate by change in coloration the presence of air contamination. The paste com-



prises a mixture of cobaltous cobalticyanide and a binder of partially hydrolyzed polyvinyl alcohol.

3,770,363

ROTARY GAS CONTROL WITH A THERMOELECTRIC IGNITION SAFETY DEVICE AND PIEZOELECTRIC IGNITER

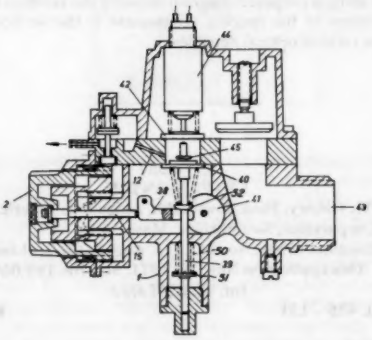
Peter Friedrich, Remscheid, Germany, assignor to Joh. Vaillant KG, Remscheid, Germany

Filed Feb. 1, 1972, Ser. No. 222,564

Claims priority, application Austria, Feb. 3, 1971, A 888

Int. Cl. F23q 7/12

U.S. Cl. 431—47 **4 Claims**



A rotary gas control apparatus has a rotary handle adapted for rotation from a gas-off position via an ignition stand-by position into a gas-on position. By the motion of the rotary handle, a piezo-electric ignition device with an impact mechanism is energized. In the ignition stand-by position, the rotary handle may be depressed, whereby a safety valve is opened and gas is allowed to flow to a pilot burner. In the depressed position, the handle is rotatable from the ignition stand-by position through a limited angle to an ingition position, whereby the ignition device is triggered and the pilot burner is lit thereby. A magnet thermoelectrically energized by the pilot burner holds the safety valve open. The handle is returned to the ignition stand-by position, moved outward and can now be rotated to the gas-on position, in which a main gas valve opens to permit the flow of gas to a main burner.

3,770,364

BURNER SEQUENCE PROGRAMMER

Lyman H. Walbridge, Ashland, Mass., assignor to Walter Kidde & Company, Inc., Clifton, N.J.

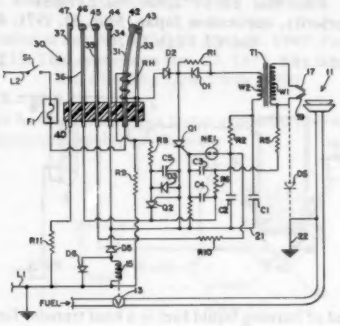
Filed Dec. 20, 1971, Ser. No. 209,685

Int. Cl. F23m 5/04

U.S. Cl. 431—78 **27 Claims**

The burner sequence programmer disclosed herein employs an electromechanical switching assembly in which a bi-metal

actuator is selectively energized so as to proceed through a sequence of states in which a plurality of contacts are operated in respective predetermined combinations. The contacts control associated circuitry which provide fuel flow con-



trol, a spark impulse generation and electrical flame testing, the actuator being energized to proceed to a stable condition in which fuel flow is maintained and spark generation is terminated if ignition is satisfactorily obtained.

3,770,365

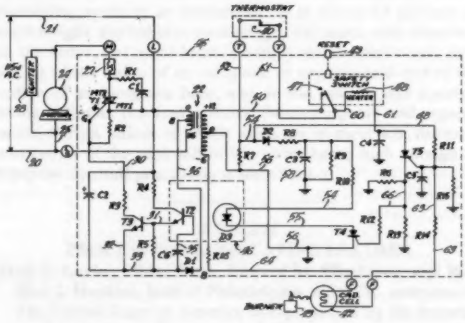
BURNER CONTROL

Robert J. Lenski, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Sept. 25, 1972, Ser. No. 292,142

Int. Cl. F23n *5/08*

U.S. Cl. 431—79 **16 Claims**



A control system for an oil burner including a motor for pumping fuel to the burner, an igniter for lighting the fuel, and an electronic switch for controlling energization of the motor and the igniter, all in a line voltage circuit, together with a low voltage circuit for controlling operation of the motor and igniter switch including a relay controlling the gate of the switch, a silicon controlled rectifier and a thermostat in circuit with the relay for energizing the same, a second silicon controlled rectifier for triggering the first mentioned rectifier, and a gate circuit for triggering the second mentioned rectifier including a light sensitive flame detector cell.

3,770,366

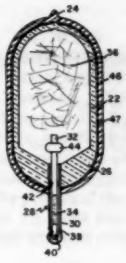
PHOTOFLASH LAMP AND METHOD OF COATING SAME

Emery G. Audesse, Salem, and Harold L. Hough, Beverly, both of Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed Sept. 11, 1972, Ser. No. 287,724

Int. Cl. F21k *5/02*

U.S. Cl. 431—94 **11 Claims**



In a photoflash lamp having a vacuum-formed thermoplastic coating over its glass envelope for providing reinforcement, a silicone mold release agent is disposed between the plastic coating and glass envelope to relieve high localized stresses and provide a more uniform compressive loading on the glass. In a method for applying the thermoplastic coating, the silicone release agent is sprayed onto the glass envelope of the lamp before it is located in a preformed sleeve of the thermoplastic material, which is subsequently vacuum-formed onto the glass envelope.

3,770,367

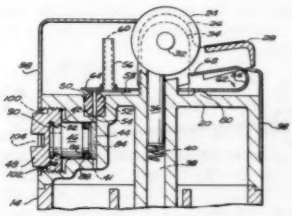
LIGHTER AND FLAME REGULATOR

Patrick R. J. Court, West Los Angeles, Calif., assignor to Paul G. Garrity, Stamford, Conn.

Continuation-in-part of Ser. No. 224,051, Feb. 7, 1972. This application July 11, 1972, Ser. No. 270,818

Int. Cl. F23q *1/02*

U.S. Cl. 431—277 **8 Claims**



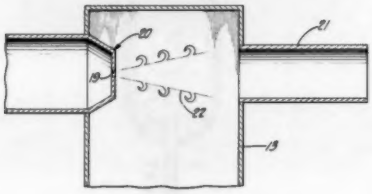
A lighter and fuel reservoir is disclosed in which the fuel utilized is a liquified gas. The lighter is characterized by a deformable valve assembly which controls the flow of gaseous fuel to a burner where it is ignited by a spark generator. The flow of fuel from the valve is activated by a spring urged slide member moved linearly although the user rotates the finger piece controlling the slide member. The flow of fuel from the reservoir to the valve assembly is controlled by a fuel regulator which includes a compressible porous member and a metallic piston, the piston acting as a heat reservoir to prevent unequal fuel flow and flame flare-up which may otherwise occur when the lighter is held in an inverted position.

3,770,368

PILOT LIGHT APPARATUS

Richard D. Grayson, Arcadia; John W. Dobson, Burbank, and Happy H. Unfried, Northridge, all of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Feb. 18, 1970, Ser. No. 12,402
Int. Cl. F23d 13/40
U.S. Cl. 431—354 2 Claims



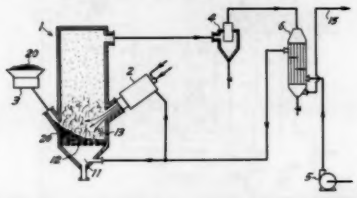
A system for providing a pilot light to the upper burner of a two burner oven including an air entrainment chamber supplied with fresh air by a vertical tube open at its lower end. Outstandingly high air-to-gas ratios are achieved by self-producing noise to disturb a jet stream of natural gas emanating from a nozzle. One important construction is the use of an approximately rectangular electric discharge machined nozzle orifice having a length-to-width ratio greater than about 3:1.

3,770,369

METHOD OF BURNING LIQUID FUEL IN FLUID BED APPARATUS

Bunji Mikami, Tokyo, and Mitsuaki Kawamura, Chiba, both of Japan, assignors to Mitsui Shipbuilding and Engineering Co. Ltd., Tokyo, Japan

Filed Mar. 22, 1972, Ser. No. 237,051
Claims priority, application Japan, Mar. 31, 1971, 46/19970
Int. Cl. F21b 15/10
U.S. Cl. 432—15 2 Claims



A method of burning liquid fuel in a heat transfer furnace to raise the temperature of particulate material in a fluidized bed. The liquid fuel is burned outside of the furnace with insufficient air to effect complete combustion, but sufficient air to gasify the liquid fuel. The gasified fuel is introduced into the furnace on one side of the bed and the air for complete combustion is introduced from the other side of the bed, the flow through the bed being used to fluidize the particulate material therein. Preferably the air discharged from the furnace is used to preheat the air both for partially burning the liquid fuel to gasify it and for completing combustion of the gasified fuel, the latter air being introduced under the bed to fluidize the same and the gasified fuel being introduced into the furnace from above the bed.

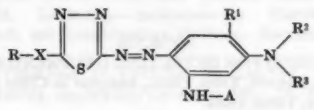
CHEMICAL

3,770,370
POLYAMIDE FIBERS DYED WITH A THIADIAZOLYL AZO COMPOUND

Max A. Weaver, and David J. Wallace, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 833,746, June 16, 1969, Pat. No. 3,657,215. This application Dec. 23, 1971, Ser. No. 211,693
Int. Cl. D06p *3/26*; C09b *29/06*
U.S. Cl. 8—41 B **9 Claims**

A fiber having a basis of a linear synthetic polyamide dyed with a compound having the formula



in which R is alkyl, allyl, cycloaklyl or aryl radical, X is -O- or -S-, A is acyl, R^1 and R^2 each is hydrogen or alkyl and R^3 is alkyl.

3,770,371
STABLE AQUEOUS DISPERSIONS OF CATIONIC DYESTUFFS

Werner Bossard, Riehen, and Francois Favre, Basle, both of Switzerland, assignors to Ciba-Geigy AG, Basle, Switzerland

Continuation of Ser. No. 781,610, Dec. 5, 1968, abandoned, which is a continuation-in-part of Ser. No. 575,513, Aug. 29, 1966, abandoned. This application Aug. 25, 1971, Ser. No. 174,964
Claims priority, application Switzerland, Dec. 8, 1967, 17284/67; June 10, 1966, 8417/66
Int. Cl. C09b *67/00*
U.S. Cl. 8—89 **6 Claims**

Stable aqueous dispersions of cationic or anionic dyestuffs which are, per se, water-soluble, which dispersions contain a stabilizing agent in an amount of up to about 15 percent of their weight, the balance consisting of (a) water and, dissolved in the latter, (b) an at least sparingly water-soluble salt consisting of the anion of an inorganic or organic acid and of the cation of an inorganic base, and, in the case of said dyestuff being cationic, (c) acid selected from inorganic and organic acids, the pK values of which acids are at most 4.8, the concentration of the said salt in the water being high enough to keep the dyestuff practically undissolved.

3,770,372
PROCESS FOR LUBRICATING LEATHER

Fred P. Luvisi, Elkins Park; Edward M. Filachione, and William J. Hopkins, both of Philadelphia, all of Pa., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 880,432, Nov. 26, 1969, abandoned, which is a continuation-in-part of Ser. No. 482,634, Aug. 25, 1965, abandoned. This application Jan. 5, 1971, Ser. No. 104,172
Int. Cl. C14c *9/02*
U.S. Cl. 8—94.23 **7 Claims**

Leather is lubricated by impregnating it with an aqueous emulsion made by mixing ASA or ASA and other oils with a water-soluble, polar organic compound. The oils are completely incorporated into the leather from the emulsion while the water-soluble, polar organic compound remains in the float.

A non-exclusive irrevocable royalty-free license in the invention herein described, throughout the world for all purposes of the United States Government, with the power to grant sublicenses for such purposes, is hereby granted to the Government of the United States of America.

3,770,373
DRYCLEANING DEODORIZING AND DISINFECTING COMPOSITIONS AND PROCESSES

George C. Schwartz, Casselberry, Fla., assignor to Schwartz Chemical Company, Incorporated, Casselberry, Fla.

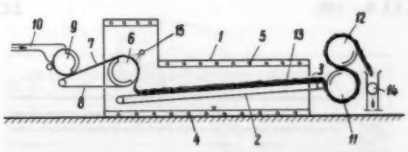
Continuation-in-part of Ser. No. 52,764, July 6, 1970, Pat. No. 3,697,220, which is a continuation-in-part of Ser. No. 852,491, Aug. 22, 1969, abandoned. This application May 10, 1972, Ser. No. 252,095The portion of the term of this patent subsequent to Oct. 10, 1989, has been disclaimed.
Int. Cl. D06l *1/00*
U.S. Cl. 8—142 **23 Claims**

Disinfection of, and production of bacteria growth inhibiting fabrics or textiles is accomplished by simultaneous dry cleaning and disinfection procedures involving contact of the textile with an antimicrobial agent containing drycleaning solution in the form of an emulsion of the "water-in-oil" type and which contains a fat solvent in the continuous phase and an aqueous solution of 1-(3-chloroallyl)-3,5,7-triaza-1-azoniaadamantane chloride in the dispersed phase. The emulsion is also effective to deodorize textiles and other objects.

3,770,374
PROCESS FOR THE CONTINUOUS STEAM TREATMENT OF STAPLE FIBER

Heinz Fleissner, Frankfurt am Main, Germany, assignor to VEPA AG, Basel/Schweiz, Germany

Filed Feb. 22, 1971, Ser. No. 117,481
Claims priority, application Germany, Feb. 21, 1970, P 20 08 079.9; Mar. 28, 1970, P 20 15 041.8
Int. Cl. D06c *1/06*
U.S. Cl. 8—149.3 **9 Claims**

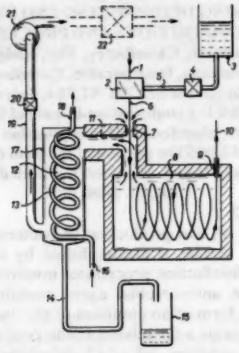


A process and apparatus for the continuous steam treatment of staple fiber which comprises a steamtight housing provided with heating means, said housing containing a heating zone and a dwell zone, sieve means rotatably disposed in the heating zone, steam distribution means associated with the surface of the sieve means, inlet means for introducing the fiber onto the sieve means, conveyor belt means disposed in the heating zone below the sieve means and extending through the dwell zone and at least one sieve means disposed behind the steamtight housing at its outlet end.

3,770,375
WORKING PROCESS FOR AN IMPREGNATION LIQUID FOR CONTINUOUS TREATMENT OF A TEXTILE FIBER BAND

Werner Naegeli, Winterthur, Switzerland, assignor to Pavena AG, Basel, Switzerland

Filed June 19, 1972, Ser. No. 263,936
Claims priority, application Germany, Dec. 22, 1971, P 21 63 959.8
Int. Cl. D06c *1/00*
U.S. Cl. 8—149.1 **12 Claims**

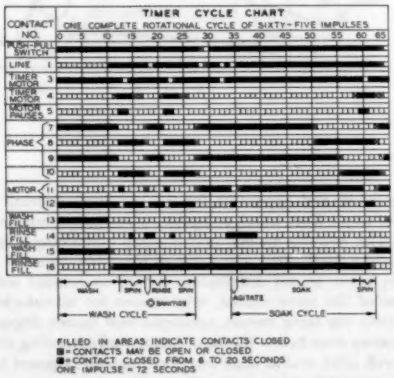


A working process for an impregnation liquid for continuous treatment of a textile fiber band, comprising the steps of applying the impregnation liquid to a fiber arrangement and delivering an impregnated fiber band, introducing the fiber band into a heated and essentially closed compartment which is at atmospheric pressure, heating the impregnated fiber band, vaporizing the impregnation liquid, removing the vapor atmosphere from the compartment and condensing the vapor atmosphere in a condensation compartment which is at a pressure differential in relation to the closed compartment.

3,770,376
METHOD FOR SANITIZING A DOMESTIC CLOTHES WASHER

Verlos G. Sharpe, Long Grove, Ill., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 158,681, July 1, 1971, Pat. No. 3,702,069. This application Aug. 23, 1972, Ser. No. 283,221
Int. Cl. D06f *39/02, 39/08*
U.S. Cl. 8—158 **2 Claims**



A method for sanitizing a domestic clothes washer wherein a predetermined concentration of liquid sanitizing solution is first distributed throughout the washer and the washer's water recirculation system, and then removed from the washer but retained in the water recirculation system.

3,770,377
PROCESS FOR INHIBITING CORROSION

Robert H. Scott, Bay City, and Hildred B. Lockhart, Houston, both of Tex., assignors to Celanese Corporation, New York, N.Y.

Filed Mar. 8, 1971, Ser. No. 122,130
Int. Cl. C23f *11/04*; C23g *1/06*
U.S. Cl. 21—2.7 R **11 Claims**

A method for preventing corrosion of metals by an acidic environment by utilizing a corrosion inhibitor which is the reaction product of an amine having a plurality of primary or secondary amino groups and an aldehyde or ketone.

3,770,378
METHOD FOR DETECTING GEOPRESSURES

Kenneth L. Russell, Tulsa, Okla., assignor to Cities Service Oil Company, Tulsa, Okla.

Filed June 18, 1971, Ser. No. 154,622
Int. Cl. E21b *47/00*; G01n *33/24*
U.S. Cl. 23—230 EP **6 Claims**

Interstitial waters of geopressured shale sections and the transition zone lying above the geopressured shale zones are measured for total salinity or elemental cationic concentration. Variances in these measurements are utilized to obtain a real time method for detecting geopressured shale zones.

3,770,379
INDICATOR FOR THE DETECTION OF MANGANESE (II) IONS

Wilhelm Baumer; Dieter Schmitt, and Alfred Stein, all of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

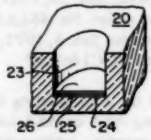
Filed Mar. 9, 1972, Ser. No. 233,316
Claims priority, application Germany, Mar. 10, 1971, P 21 11 366.6
Int. Cl. G01n *31/22*
U.S. Cl. 23—230 R **20 Claims**

Indicator for the detection of manganese (II) ions comprising an abosrbent support carrier impregnated with a substantially insoluble sulfate salt of an aromatic amine oxidizable by MnO_2 to a colored oxidation product.

3,770,380
ARTICLE AND METHOD FOR MULTIPLE IMMUNE ADHERENCE ASSAY

James E. Smith, Camillus, N.Y., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 19, 1971, Ser. No. 135,048
Int. Cl. G01n *33/16*
U.S. Cl. 23—230 B **6 Claims**



An article, useful for detecting and assaying immune-adherence-reaction agglutinates, which article includes a com-

ponent which (i) is a light-transparent base material coated with a dried film of diluted calf serum, (ii) has on top of said coating an antigen-containing overcoating, and (iii) is adapted to function in assembled arrangement in said article to provide a test cell of which a surface is said overcoating; and an assay method employing said article which method includes (a) contacting a liquid which contains specific antibody-coated indicator particles with said overcoating to form agglutinates at the interface of the liquid and overcoating, and (b) then detecting and determining the agglutinates formed at the interface.

3,770,381

PROCESS FOR THE DETERMINATION OF PEROXIDES

Dieter Schmitt; Alfred Stein, and Wilhelm Baumer, all of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

Filed Mar. 21, 1972, Ser. No. 236,791

Claims priority, application Germany, Mar. 26, 1971, P 21 14 638.3

Int. Cl. G01n *31/22*

U.S. Cl. 23—230 R **10 Claims**

A process for semiquantitative colorimetric detection of organic peroxides, especially ether peroxides, with the aid of peroxide indicating means comprising an absorbent carrier impregnated with peroxides, a colorimetric indicator, optionally a buffer, and optionally other additives. The indicating means is immersed in a solution of peroxides in a volatile organic solvent having a boiling point of below 80° C., preferably of below 50° C., and withdrawn. The indicating means is placed in a water vapor atmosphere having a relatively constant temperature between about 20 and 100° C. to evaporate the organic solvent and deposit moisture on the surface thereof, and then examined for color change.

3,770,382

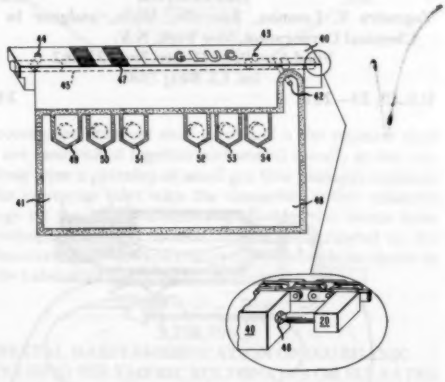
AUTOMATIC CLINICAL ANALYZER

Elbert P. Carter; Donald R. Johnson; James E. McErlane, all of Wilmington; Richard G. Nadeau; Gerrit Nieuweboer, both of Claymont, all of Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 753,197, Aug. 16, 1968. This application July 15, 1971, Ser. No. 162,869

Int. Cl. G01n *33/16, 21/24*

U.S. Cl. 23—253 R **7 Claims**



An apparatus for automatically performing analytic procedural steps on a fluid contained in a disposable deformable test pack. The apparatus consists of a means for filling the test pack with ample fluid, a means for controlling the environment of the test pack, a means for initiating reactions within the test pack, a means for analyzing the fluid in the test pack, and a transport means designed to hold the test pack and to transport it between the various operating stations. Associated circuitry combining method switching and control logic make the operation of the instrument fully automatic.

3,770,383

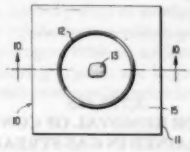
DIAGNOSTIC TEST SLIDE

Richard Thompson Price, Verona, N.J., assignor to Akzona Incorporated, Asheville, N.C.

Continuation-in-part of Ser. No. 131,172, April 5, 1971, Pat. No. 3,666,421, which is a continuation-in-part of Ser. No. 818,366, April 22, 1969, abandoned. This application Dec. 30, 1971, Ser. No. 214,213

Int. Cl. G01n *33/16*

U.S. Cl. 23—253 TP **9 Claims**



A test slide for the performance and observation of an immunochemical or diagnostic test on its surface, which surface is insoluble in, impermeable to, non-absorbent to, and wettable by, water, carries on its surface at least one circumscribed test area containing a single solid dried stable spot deposit of an immuno-chemical reagent providing a predetermined amount of an antigen or an antibody, or alternatively, a second solid dried spot of a buffer material, said spot or spots upon being moistened with a liquid and/or the liquid to be tested being reconstituted to the reagent and/or buffer, to form an observable area of reaction mixture.

3,770,384

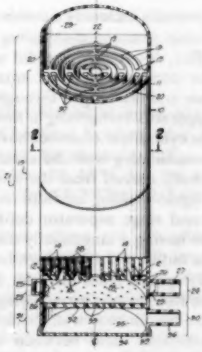
TWO-PHASE FLUID FLOW GUIDE FOR BLOOD OXYGENATOR

Robert C. Brumfield, 73 Emerald Bay, Laguna Beach, Calif.

Filed Nov. 29, 1971, Ser. No. 202,779

Int. Cl. A61m *1/03*

U.S. Cl. 23—258.5 **14 Claims**



Blood flows in extra-corporeal blood circulation into a blood oxygenator. The oxygenating gas enters the blood streams through a means providing oxygenating gas injection, adjacent a means providing blood inlet. The pair of means co-react to provide two-phase flow of blood and oxygenating gas

bubbles for the two-phase fluid flow guide. The flow guide has a multiplicity of fluid guide, solid walls of equal length, one wall uniformly closely spaced to another wall. The spaced walls are held in a boundary case by wall securing means which provide a uniform base terminus position and a uniform top terminus position for the walls. The boundary case can have a case length at least equal to the fluid guide wall lengths and greater. The fluid guide solid wall can have multiple, uniform cross section flow control channels disposed in the wall, extending normally to the base terminus and the top terminus of the wall. The flow control channels stabilize the upward flow of the two-phase blood and oxygenating gas combination. The flow control channels stabilize the gas bubble-liquid interface flow geometry, and facilitate the rapid fixation of oxygen by the blood and the release of carbon dioxide into the gas phase exiting from the top terminus of the two-phase fluid flow guide.

3,770,385

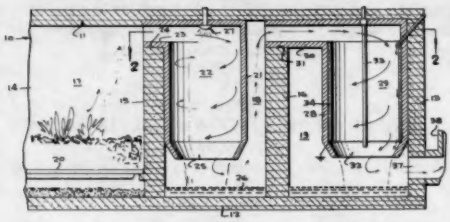
APPARATUS FOR REMOVAL OF CONTAMINANTS ENTRAINED IN GAS STREAMS

Jerry Grey, and Auram B. Zanft, both of New York, N.Y., assignors to Morse Boulger, Inc., Corona, N.Y.

Division of Ser. No. 83,713, Oct. 26, 1970, Pat. No. 3,656,441. This application Nov. 30, 1971, Ser. No. 203,335

Int. Cl. B03c *3/78*; **B01d** *47/06*; **F23g** *5/00*

U.S. Cl. 23—260 **4 Claims**



An incinerator generally including a combustion chamber, a flue and an apparatus intercommunicating the combustion chamber and the flue, for removing solid and gaseous contaminants from the combustion gases emanating from the combustion chamber and discharged through the flue into the atmosphere, the apparatus comprising a first stage separator defining at least one cylindrical chamber having a tangentially disposed inlet communicating with the combustion chamber, an outlet longitduinally spaced from the inlet and means for applying a film of liquid-washing medium on the interior wall thereof, and a second stage separator defining at least one cylindrical chamber having a tangentially disposed inlet communicating with the outlet of the first mentioned chamber, an outlet longitudinally spaced from the inlet thereof and communicating with the flue, means for applying a film of liquid-washing medium on the interior wall thereof and means for producing an electrostatic field between a locus with the chamber and the interior wall thereof, of sufficient strength to produce a corona discharge for ionizing solid and gaseous contaminants contained in the gases traversing therethrough whereby the contaminants will be subjected to combined centrifugal, electrostatic and gravitational forces to cause the contaminants to be diverted into contact with the film of liquid-washing medium and be removed therewith.

3,770,386

APPARATUS FOR PURIFYING CRYSTALS COMPRISING A STIRRER WITH FINS FORMING A DISCONTINUOUS SPIRAL

Yasuo Hayashi; Kenji Kodama; Minoru Ohta, and Shigeru Saito, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 812,703, April 2, 1969, abandoned. This application Sept. 28, 1970, Ser. No. 76,123

Claims priority, application Japan, Apr. 2, 1968, 43/21566; June 25, 1968, 43/44020

Int. Cl. B01d *11/00*

U.S. Cl. 23—270 **10 Claims**

A method and apparatus for continuously purifying a crystalline substance containing an impurity having a lower melting point than that of the crystalline substance, comprising continuously purifying crystals in a purification tower, said tower being provided with a stirrer for transporting said crystals upwards in said tower while preventing the crystals from coagulating, the stirrer having fins arranged spirally along the axis thereof at an angle opposite to the direction of the spiral, melting at least a portion of the purified crystals, refluxing a portion of the melting crystals to the inside of the tower to wash the ascending impure crystals, and removing the remaining portion of the purified crystals from the tower.

3,770,387

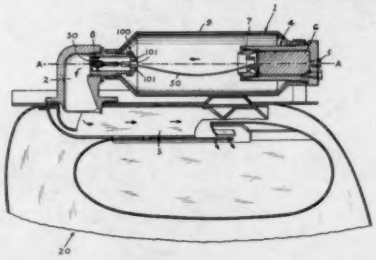
DEFLECTOR

Yogendra S. Loomba, Roseville, Mich., assignor to Allied Chemical Corporation, New York, N.Y.

Filed Apr. 9, 1971, Ser. No. 132,862

Int. Cl. B01j *7/00*

U.S. Cl. 23—281 **2 Claims**



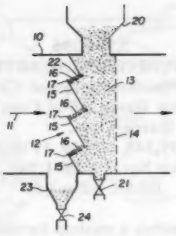
An interior deflector covering the opening communicating to the manifold and bag assembly in a gas generating device.

3,770,388

GRANULAR BED FILTER REACTOR

Frederick A. Zenz, Rt. 9D, Garrison, N.Y.

Filed May 24, 1971, Ser. No. 146,379
Int. Cl. B01j 9/02
U.S. Cl. 23—284 **5 Claims**



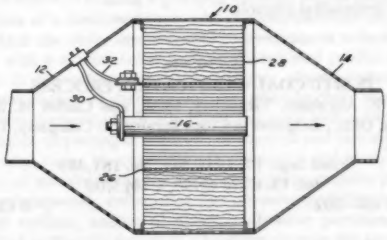
A granular bed filter-reactor in which mechanical means are provided to limit the amount of filter media removed during a blow back operation.

3,770,389

CATALYTIC CONVERTER WITH ELECTRICALLY RESISTIVE CATALYST SUPPORT

Ernest W. Kitzner, Allen Park; Alex Rhodes, Orchard Lake, and Moses Shachter, Oak Park, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 11, 1971, Ser. No. 197,768
Int. Cl. B01j 9/04
U.S. Cl. 23—288 F **2 Claims**



A corrugated stainless steel sheet and a flat stainless steel sheet are sandwiched together and wound spirally so the corrugations form a plurality of small gas flow passages connecting the converter inlet with the converter outlet. Alumina coatings on the sheets electrically insulate the sheets from each other and a finely divided catalyst is distributed on the alumina coatings. Electrical energy flows through the sheets to heat the catalyst to operating temperature.

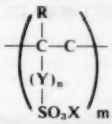
3,770,390

CRYSTAL HABIT MODIFICATION OF INORGANIC SALTS USING POLYMERIC SULFONATES OR SULFATES

Arthur S. Teot, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 26, 1971, Ser. No. 119,396
Int. Cl. B01d 9/02
U.S. Cl. 23—300 **4 Claims**

Disclosed herein is an improved method for crystallizing water-soluble inorganic salts. The improvement comprises adding to the crystallizing system a small amount of a monovalent salt of a polymeric sulphonate or sulfate characterized by the formula:



wherein R is hydrogen or methyl, m is an integer from 3 to 3,000, *n* is 0 or 1, and Y is a connecting group which is oxo, phenyl, phenoxy, carboxy alkyl or similar organic radical. The X portion of the sulphonate or sulfate group is a monovalent cation such as hydrogen, lithium, sodium, potassium and ammonium. The resulting crystals are larger and more regularly shaped than crystals produced by prior art methods.

3,770,391

LANTHANUM CONTAINING POWDERS FOR MAKING OXIDATION RESISTANT METALLICS, METHOD OF MAKING SAME, AND METALLIC PRODUCTS

Robert Blanchard Herman Herchenroeder, Kokomo, Ind., assignor to Cabot Corporation, Billerica, Mass.

Division of Ser. No. 917, Jan. 6, 1970, Pat. No. 3,639,116. This application Dec. 1, 1971, Ser. No. 203,924
Int. Cl. B22f 1/00
U.S. Cl. 29—182 **3 Claims**

A powder blend suitable for compaction and metallurgical bonding which contains at least 10 percent chromium and preferably at least 15 percent chromium, more than 30 percent and preferably more than 38 percent of either nickel, cobalt, or any combination thereof, and a lanthanum-silicon alloy containing at least 0.4 percent silicon, the lanthanum-silicon alloy being present in sufficient quantity such that the lanthanum content of the total powder mixture is about 0.02 to 0.2 percent and preferably 0.02 to 0.1 percent (by weight).

Products made from this blend as well as the method of making same are also disclosed.

3,770,392

MOLYBDENUM-BASE ALLOYS

Lufti H. Amra, Cleveland Heights, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed May 10, 1971, Ser. No. 141,958
Int. Cl. B22f 3/12, 5/00
U.S. Cl. 29—182 **1 Claim**

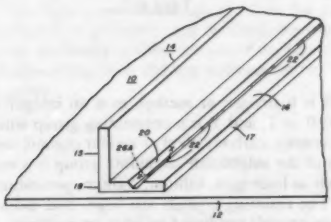
Molybdenum-base alloys are described having a novel crystalline phase structure to provide improved ductility and machinability at room temperature along with improved mechanical properties at elevated temperatures. The alloy has been found particularly suitable for die casting molds to be used in casting ferrous metals as well as non-ferrous metals. The alloy composition has a molybdenum content of at least 90 percent by weight, a nickel content range between 2 and 8 percent by weight, a copper content between 0.5 and 2 percent by weight and may include minor amounts of other alloying metals such as iron, silicon and manganese. A liquid phase sintering method of preparation has been found to optimize the final properties of these alloy compositions.

3,770,393

RIGID METAL PANELS

Malcolm G. Hoy, New Kensington, and William R. Tyler, Oakmont, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Oct. 22, 1971, Ser. No. 191,852
Int. Cl. B32b *15/00*
U.S. Cl. 29—191 **2 Claims**



A rigid panel and a method of making the same, the panel being comprised of a relatively thin gauge sheet of metal and at least one rigid, stiffening member welded to the rear face of the metal sheet. The stiffening member is welded to the sheet by depositing weld metal in spaced apart openings provided in the stiffening member, the openings being located along the bottom of a longitudinally extending groove provided in the stiffner. Opposed side walls of the groove diverge outwardly from the bottom thereof to the surface of the stiffener remote from the metal sheet to provide the groove with a relatively wide dimension at the remote surface, and a relatively narrow dimension at the bottom of the groove and adjacent the metal sheet.

3,770,394

STAINLESS STEEL TUBING WITH A MAXIMUM TITANIUM TO CARBON RATIO OF 6

Jerome P. Bressanelli, Pittsburgh, Pa., assignor to Crucible Inc., Pittsburgh, Pa.

Filed Sept. 14, 1970, Ser. No. 71,713
Int. Cl. B32b *15/02*
U.S. Cl. 29—193 **3 Claims**

A longitudinally welded stainless steel tubing and a method for producing the same wherein a continuous band of stainless steel of the composition, in percent by weight, carbon 0.08 max., manganese 2 max., phosphorus 0.045 max., sulfur 0.045 max., silicon 1 max., nickel 1.25 max., chromium 10 to 13.5, titanium at least 0.10 with a maximum titanium to carbon ratio of 6, nitrogen 0.05 max., iron balance, is formed into a generally cylindrical shape to produce a longitudinal seam, heating the metal adjacent said seam to a temperature above the transformation temperature of said steel and bringing the heated edges into contact and at a pressure to cause welding thereof. The tubing is characterized by improved flareability, along with good corrosion resistance, ductility, fabricability and weldability.

3,770,395

FERROMAGNETIC MATERIAL

Erich Sawatzky, San Jose, and George Bryan Street, Palo Alto, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 202,642, Dec. 26, 1971, abandoned. This application Sept. 15, 1972, Ser. No. 289,512
Int. Cl. B32b *15/04*; **C22c** *31/00*
U.S. Cl. 29—194 **22 Claims**

A room temperature stable ferromagnetic permanent magnet ternary intermetallic compound with a large Faraday rotation and having a Curie temperature in the region of substantially 75°–190°C having atomic proportions indicated by the formula:

$$Mn_{0.8-1.2}Ga_{0.6-1.3}Ge_{0.6-2.3}$$

In film form, the magnetization is normal to the film plane. Additionally, Al, B, In or Tl may be added to the film to lower the Curie temperature while still maintaining a tetragonal structure.

3,770,396

COMPOSITE METAL ARTICLE

Michael J. Pryor, Woodbridge; Jacob Crane, Hamden, and Joseph Winter, New Haven, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Division of Ser. No. 59,348, July 29, 1970, Pat. No. 3,738,827. This application Nov. 19, 1971, Ser. No. 200,505
Int. Cl. B23p *3/00*
U.S. Cl. 29—199 **3 Claims**

The disclosure teaches a method for adding solid metal to molten metal, especially without deleterious reaction with air. The method is characterized by providing the solid metal in rod or wire form clad with a material compatible with the molten metal and feeding the clad material into the molten metal. The disclosure teaches novel composites to achieve this end. The method is particularly useful in deoxidizing molten metal.

3,770,397

LIQUID HYDROCARBON FUELS CONTAINING ALKALI METAL SALTS OF ALKYL AND DIALKYL-AMINOALKYL PHENOLS, AS ANTIKNOCK AGENTS

El-Ahmadi I. Heiba, and Stamoulis Stournas, both of Princeton, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed June 19, 1972, Ser. No. 263,904
Int. Cl. C01l *1/22*
U.S. Cl. 44—75 **8 Claims**

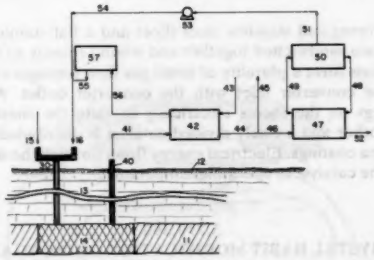
Liquid hydrocarbon fuel compositions are provided containing antiknock quantities of alkali metal salts of alkyl and dialkyl-aminoalkyl phenols.

3,770,398

IN SITU COAL GASIFICATION PROCESS

George E. Abraham, Vicksburg, Miss., and Carlos M. Royo, Tulsa, Okla., assignors to Cities Service Oil Company, Tulsa, Okla.

Filed Sept. 17, 1971, Ser. No. 181,489
Int. Cl. E21c *43/00*; **C10j** *5/00*
U.S. Cl. 48—202 **8 Claims**



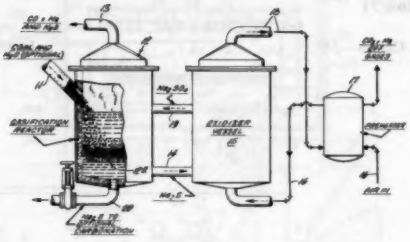
A method for in situ coal gasification to recover a calorific value gas by the water-gas shift reaction for the optimum formation of carbon monoxide and hydrogen through the simultaneous introduction of carbon dioxide and steam into an injection well in order to shift the reaction kinetics of the process to favor the water-gas shift reaction.

3,770,399

COAL GASIFICATION PROCESS

Victor Manuel Chong, Media, Pa., assignor to Sun Research and Development Co, Philadelphia, Pa.

Filed Oct. 22, 1971, Ser. No. 191,691
Int. Cl. C10j *3/00, 3/46*
U.S. Cl. 48—202 5 Claims



A process for coal gasification whereby coal is converted to carbon monoxide, hydrogen and other gaseous products by contact with molten sodium sulfate, said sodium sulfate being reduced to sodium sulfide, which is regenerated with oxygen to sodium sulfate to provide a cyclic process.

3,770,400

METHOD OF MAKING GRINDING MEMBERS

Raymond Thomas Hallewell, Hillingdon Heath, Middlesex, England, assignor to Toolmasters Limited, Hillingdon Heath, Middlesex, England

Continuation-in-part of Ser. No. 695,561, Jan. 4, 1968, Pat. No. 3,551,125. This application Jan. 6, 1969, Ser. No. 789,360
Claims priority, application Great Britain, Jan. 4, 1968, 717/68
Int. Cl. B24b *53/06;* B24d *5/00*
U.S. Cl. 51—295 20 Claims

A method of making a grinding member comprising a composition of a hardened resin and abrasive particles on a base, in which the resin in a kneadable condition is rolled on the base with a master roller to a predetermined profile and the resin is thereafter caused to harden slowly substantially without change of shape or volume, wherein there is included the improvement of initially filling the resin with a particulate substance imparting at least one of thermal and electrical conductivity, heat-, shock- and wear-resistance and ready wearability, of initially filling the resin with coarse abrasive particles and subsequently embedding fine abrasive particles in its exposed surface, and/or of bonding abrasive particles to the profiled surface by means of a hardenable resin the same as or compatible with that of the composition.

3,770,401

PHOSPHATE-BONDED GRINDING WHEEL

Herbert D. Sheets, Jr., Columbus, Ohio; Ronald A. Meyer, Beloit, Wis., and Martin J. O'Hara, Columbus, Ohio, assignors to Litton Industries, Inc., Beverly Hills, Calif.

Filed Apr. 5, 1971, Ser. No. 131,435
Int. Cl. B24d *3/02;* C09c *1/68*
U.S. Cl. 51—308 12 Claims

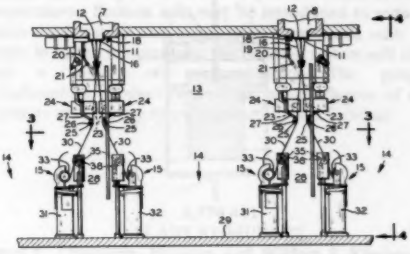
An abrasive body of grit-size particles of alumina or silicon carbide held together by a water-insoluble aluminum phosphate bonding matrix, which body is of increased strength through its phosphate bonding matrix containing a small amount of at least one or both of particlate aluminum and an in-situ formed phospho-silicate; and an improved molding composition for preparing the abrasive body, which molding composition contains up to 12 percent by weight thereof of particulate aluminum of minus 200 mesh size and/or sodium silicate having a SiO_2 to Na_2O weight ratio greater than 1 and less than 3.8.

3,770,402

APPARATUS FOR PROCESSING WOUND STRAND FROM FILAMENT FORMING MATERIALS

Svend Aage Petersen, Toledo, and Samuel Richard Genson, Weston, both of Ohio, assignors to Johns-Manville Corporation, New York, N.Y.

Filed Nov. 18, 1971, Ser. No. 200,082
Int. Cl. C03b *37/02*
U.S. Cl. 65—11 W 6 Claims



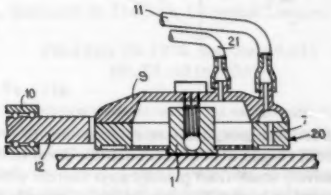
An arrangement of equipment for processing strands of thermo-plastic material in which a common supply channel feeds a plurality of bushings from which filaments making up strands are drawn. The bushings are closely spaced in alignment along the length of the supply channel. A row of winders is located on each side of a projected vertical plane extending through the longitudinal center line of the bushings and supply channel with alternate bushings grouped in a first and second group along the length of the supply channel so that the first group is arranged to supply filaments and resultant strands to adjacent winders on a first side of the projected plane while the second group supplies filaments for the strands to adjacent winders on the second side of the projected plane. Thus, adjacent bushings supply winders on opposite sides of the projected plane. The winders on each side of the projected plane are oriented with their winding axes generally parallel to the plane.

3,770,403

METHOD OF MAKING MAGNETIC HEAD ASSEMBLY HAVING GLASS CERAMIC BONDED PARTS

Keith Maries, London, and Derek Frank Case, Sunbury-on-Thames, both of England, assignors to International Computers Limited, London, England

Filed June 11, 1971, Ser. No. 152,195
Claims priority, application Great Britain, June 16, 1970, 29,070/70
Int. Cl. G11b *5/42*
U.S. Cl. 65—43 1 Claim



At least two parts of a magnetic head assembly are bonded together using glass-ceramic material in its ceramic phase.

3,770,404

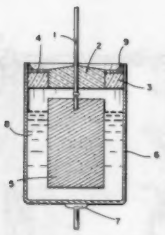
METAL-TO-GLASS-TO-CERAMIC SEAL

Edwin Russell Koons, Whiteland, Ind., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Division of Ser. No. 3,158, Jan. 15, 1970, Pat. No. 3,638,076. This application Sept. 24, 1971, Ser. No. 183,707

Int. Cl. C03c *27/02*

U.S. Cl. 65—59 **9 Claims**



A method of making a seal comprising a metal member bonded to a glass member, said glass member in turn bonded to a ceramic member, said glass member and said ceramic member being resistant to corrosive materials in the device being sealed, said metal member, glass member and ceramic member having compatible coefficients of thermal expansion.

3,770,405

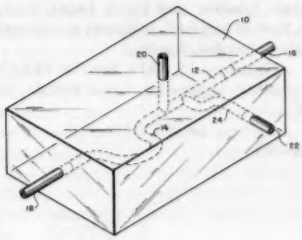
METHOD OF FABRICATING LABORATORY GLASSWARE

William M. DeAngelis; Reinhardt F. Luthmann, both of Wilton, Conn.; Charles A. Meehan, West Caldwell, N.J., and M. Howe Smith, Norwalk, Conn., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Apr. 24, 1972, Ser. No. 246,966

Int. Cl. C03b *23/20*

U.S. Cl. 65—23 **9 Claims**



A method of fabricating laboratory glassware to provide a relatively small, rugged article of monolithic form having one or more relatively small fluid passageways therein which may be characterized as having the appearance of wormholes. The method includes the step of preforming sacrificial tubing, sections of which may be socketed together, and socketing the tubing with tubular connectors on assembly, prior to encapsulating the assembly in glass material. The sacrificial tubing is removed after encapsulation.

3,770,406

MANUFACTURE OF WIRED GLASS ON MOLTEN METAL BATH

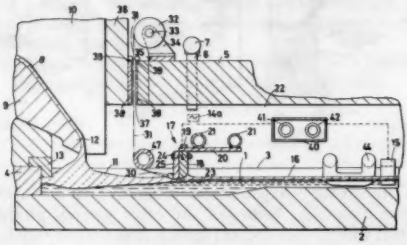
Albert Sidney Robinson, Birkdale, Southport; David Gordon Loukes, Eccleston Park, Prescot, and Jack Lawrenson, St. Helens, all of England, assignors to Pilkington Brothers Limited, Liverpool, Lancashire, England

Filed Sept. 11, 1972, Ser. No. 287,715

Claims priority, application Great Britain, Sept. 16, 1971, 43,268/71

Int. Cl. C03b *13/12, 18/00*

U.S. Cl. 65—51 **14 Claims**



Wired glass is produced by forming a pool of molten glass on a bath of molten metal, holding back the pool by a flow regulating member and drawing a ribbon of glass away from the downstream end of the pool. Reinforcing wire is fed into the pool upstream of the flow regulating member and is guided beneath that member. The glass is heated in the region of the flow regulating member and the ribbon of wired glass is rapidly cooled and stabilised as it is drawn away from the downstream end of the pool.

3,770,407

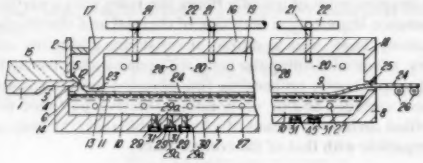
GLASS MANUFACTURING METHODS

Jack Lawrenson, St. Helens, England, assignor to Pilkington Brothers Limited, Liverpool, Lancashire, England

Filed Apr. 2, 1971, Ser. No. 130,731

Int. Cl. C03b *18/00*

U.S. Cl. 65—99 A **5 Claims**



The temperature of the molten metal of the bath, in the float process for flat glass manufacture, is regulated by means of thermally conductive fins, e.g. of carbon, inset into the floor of the tank structure and in direct thermal contact with the molten metal of the bath. The outer end of each fin is cooled to give localised heat extraction from the molten metal.

3,770,408

ANNEALING LEHR

Joseph B. McCully, Maumee, Ohio, assignor to Midland-Ross Corporation, Cleveland, Ohio

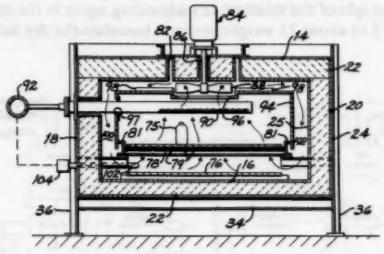
Filed Nov. 15, 1971, Ser. No. 198,849

Int. Cl. C03b *25/04*

U.S. Cl. 65—162 **8 Claims**

An endless belt conveyor annealing lehr having burner means located above the belt. The belt is foraminous and supported throughout the length of the lehr by a system of per-

forated plates. A shroud extends intermediate the walls of the lehr and a fan is located adjacent to the burner means outlet. This combination results in a continuous circulating at-



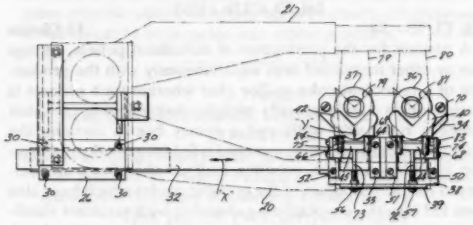
mosphere impinging directly upon the work being conveyed through the lehr. Means is also provided to control the temperature of the work throughout the length of the lehr, particularly at the entrance thereof.

3,770,409

APPARATUS FOR GUIDING GOBS OF MOLTEN GLASS

Robert D. Colchagoff, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Dec. 23, 1971, Ser. No. 211,195
Int. Cl. C03b 7/00
U.S. Cl. 65—225 **5 Claims**



Apparatus for guiding gobs of molten glass that have been sheared from streams of molten glass issuing downwardly from a glass feeder. A horizontal arm is positioned such that one end is attached to the glass feeder and the other end terminates at a point slightly offset from the axis of gobs being sheared by the feeder mechanism. Mounted on the offset portion of the arm is a V-shaped guide block. The guide block is mounted such that it may be moved in two directions to insure centering of the V-shaped guide block with respect to the molten gobs of glass. Attached to the lower portion of the offset arm is a drop funnel positioned to receive gobs guided by the V-shaped guide block. The funnel is an elongated tubular member which has a generally circular cross-section near its upper end and tapers into a somewhat smaller, circular, opening at its lower end. The V-shaped guide block is formed hollow and is divided into two separate intercommunicating chambers to allow the introduction and circulation of a cooling fluid into and out of the V-shaped guide block to insure its proper functioning.

3,770,410

PRODUCTION OF POTASSIUM POLYPHOSPHATES FROM PHOSPHATE ACID SLUDGES

Harold E. Mills, and Michael B. Caesar, both of Lake City, Fla., assignors to Occidental Petroleum Corporation, Los Angeles, Calif.

Filed Sept. 10, 1971, Ser. No. 179,541
Int. Cl. C05b 7/00
U.S. Cl. 71—1 **33 Claims**

Phosphate acid sludges formed in the production of wet process phosphoric acids are converted to potassium polyphosphates by reaction with a potassium salt at elevated temperatures. Sodium salts may be introduced to reduce the fusion temperature and magnesium compounds with an increase in fusion temperature; the reaction system will also accept a variety of micronutrients. The potassium polyphosphate product formed has a high degree of citrate solubility establishing its excellent utility as a fertilizer.

3,770,411

PLANT STIMULANT

James C. Chambers, Houston, and William S. Kimbro, Conroe, both of Tex., assignors to Organic Laboratories, Inc., Houston, Tex.

Filed July 29, 1971, Ser. No. 167,503
Int. Cl. C05f 11/00
U.S. Cl. 71—24 **11 Claims**

A liquid plant growth stimulant and a process for making the same is disclosed in which the stimulant is formed by mixing a crushed humic acid bearing ore first in a quantity of water, then mixing the resulting slurry with a quantity of ammonia, then mixing the resultant slurry with a quantity of phosphoric acid, and if desired, then adding organic trace elements to the resultant mixture.

3,770,412

HERBICIDAL METHOD EMPLOYING ARYLTHIOHYDRAMIC ACIDS

John E. Franz, Crestwood, Mo.

Filed Dec. 2, 1971, Ser. No. 204,306
Int. Cl. A01n 9/12
U.S. Cl. 71—98 **4 Claims**

Herbicidal compositions containing as the herbicidally active ingredient an aromatic thiohydroxamic acid and herbicidal methods employing such compositions are disclosed. Benzothiohydroxamic acids are useful in controlling undesirable vegetation.

3,770,413

METHOD OF INHIBITING CORROSION

Edward J. Tabor, and Floyd R. French, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed July 28, 1970, Ser. No. 59,011
Int. Cl. A01n 9/24
U.S. Cl. 71—116 **1 Claim**

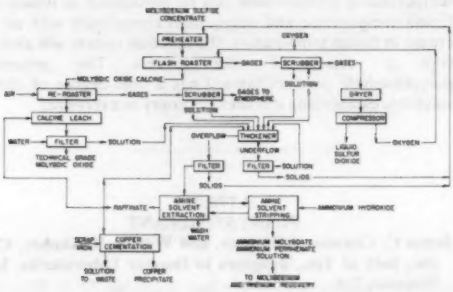
The combination of boric acid or a soluble salt thereof and a halophenoxyalkanoic acid or salt thereof is effective to inhibit corrosion of ferrous metals when in contact with aqueous fluids containing said combination. The inhibitory composition is particularly useful in inhibiting the corrosion of metal in contact with herbicidal compositions of which the active ingredient is halophenoxy-alkanoic acid or salt, especially when the composition also includes a corrosive chelating agent, e.g., citric acid, tartaric acid, nitrilotriacetic acid, ethylenediaminetetraacetic acid or the like.

3,770,414

RECOVERY OF RHENIUM AND MOLYBDENUM VALUES FROM MOLYBDENITE CONCENTRATES

James L. Lake; John E. Litz; Robert B. Coleman, all of Lakewood, Colo.; Marcel Goldenberg, Tarrytown, N.Y., and Milos Vojkovic, Libertyville, Ill., assignors to Continental Ore Corporation, New York, N.Y.

Filed Dec. 28, 1970, Ser. No. 101,784
Int. Cl. C22b *1/02*
U.S. Cl. 75—1 14 Claims



An improvement in the recovery of molybdenum and rhenium values by roasting molybdenite which comprises preheating finely divided molybdenite concentrate and passing it downwardly through a vertically oriented reaction zone countercurrent to an upwardly traveling stream of high temperature oxygen, oxygen enriched air or oxygen-sulfur dioxide mixture heated by its passage through a roasting hearth at the bottom of the reaction zone. The rate of oxidation of sulfides is controlled by various means to keep the temperature in the reaction zone below that at which molybdenum oxide volatilizes with resultant inhibition of the volatilization of rhenium oxide. The process is attractive from the standpoint of pollution control as by-product sulfur dioxide gas ordinarily released to the atmosphere is produced in the exhaust gases in concentrations high enough to make its recovery economically feasible.

3,770,415

METHOD FOR RECOVERING IRON FROM BLAST FURNACE AND BASIC OXYGEN FURNACE WASTES

Milvio Carignani, Taranto; Michele Conti, Genoa-Quarto; Dufour Berte, Casimiro; Geremia Rossi, Genoa; Edoardo Pasero, Rome, and Hermann Zmolnig, Genoa, all of Italy, assignors to Italsider S.p.A., Genoa, Italy

Filed Sept. 2, 1970, Ser. No. 69,054
Claims priority, application Italy, Sept. 10, 1969, 7304 A/69; Japan, July 12, 1970, 45/107588
Int. Cl. C21b *1/08*
U.S. Cl. 75—3 19 Claims

A method and device for transforming slurries coming from wet purification plants for fumes from blast furnaces and basic oxygen furnaces into a controlled size granular solid material.

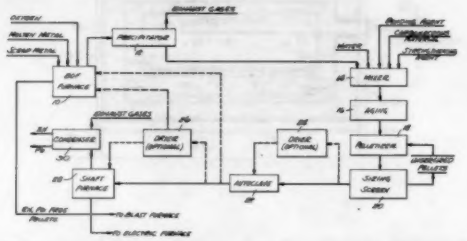
3,770,416

TREATMENT OF ZINC RICH STEEL MILL DUSTS FOR REUSE IN STEEL MAKING PROCESSES

Mehmet Adnan Goksel, Houghton, Mich., assignor to Board of Control of Michigan Technological University, Houghton, Mich.

Filed Apr. 17, 1972, Ser. No. 244,769
Int. Cl. C21b *3/04*
U.S. Cl. 75—25 11 Claims

Crush-resistant, metallized agglomerates, containing substantially no zinc or lead and capable of being charged to various steel-making furnaces, are produced from dust recovered from the fumes of a basic oxygen or open hearth steel-making furnace by forming a moistened mixture of (a) the dust (b) finely divided solid carbonaceous material containing sufficient carbon to make the total equivalent fixed carbon content of the mixture about 5 to about 25 weight percent, based on the dry weight of the mixture, (c) a bonding agent in the range of about 5 to about 25 weight percent, based on the dry weight



of the mixture, and (d) one or more additional strengthening agents in minor amounts; forming the resultant mixture into green agglomerates; hydrothermally hardening partially dried or dried agglomerates at a temperature substantially below the combustion or decomposition temperature of the carbonaceous material; and then heating the hardened agglomerates at an elevated temperature for a sufficient time to reduce the iron oxide to metallic iron and to reduce and volatilize the zinc, lead and other reducible impurities therein.

3,770,417

SIMULTANEOUS PRODUCTION OF METALLIZED ORES AND COKE

Ray E. Kranz, Pittsburgh, Pa., assignor to Salem Corporation, Pittsburgh, Pa.

Filed Feb. 23, 1971, Ser. No. 118,088
Int. Cl. C21b *13/00*
U.S. Cl. 75—34 11 Claims

A process for the production of metallized pellets, sponge iron or other metallized ores simultaneously with the production of a reductant coke and/or char wherein such process is carried on in a substantially airtight devolatilizing chamber having a roof, side walls and a rotary hearth forming the chamber. A carbonaceous material is fed into the devolatilization chamber and the volatiles evolved therefrom are employed for the reduction of the metallic oxides which have also been fed into the devolatilizing chamber with resultant simultaneous production of coke and/or char and metallized pellets, sponge iron or other metallized ores.

3,770,418

METHOD OF MELTING IRON WITH LUMPS OF CARBON COKE

Thomas J. Wilde, Box 411, Frazier Park, Calif.

Division of Ser. No. 814,706, April 9, 1969, Pat. No. 3,619,148, which is a division of Ser. No. 714,398, March 4, 1968, Pat. No. 3,444,047, which is a continuation-in-part of Ser. No. 547,683, April 1, 1966, abandoned, which is a continuation-in-part of Ser. No. 329,090, Dec. 9, 1963, abandoned. This application May 21, 1971, Ser. No. 145,861
Int. Cl. C21c *5/34*
U.S. Cl. 75—43 9 Claims

Metallurgical coke is made from carbon particles by heating the particles to shrink them. Thereafter, the shrunk carbon particles are mixed with a carbonaceous binder and formed into lumps which are heated in a non-oxidizing atmosphere to drive off volatiles and carbonize the binder. Such coke used for melting iron takes less air, less fuel and permits lower bed heights than conventional fuel.

3,770,419
PYROLYSIS PROCESS SYSTEM FOR RECYCLING OF REFUSE

Harry D. Brown, Grand Junction, Colo., assignor to Ebert E. Lewis, Grand Junction, Colo., a part interest

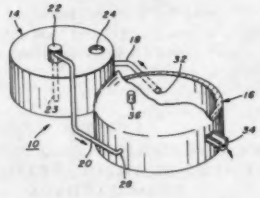
Filed July 19, 1971, Ser. No. 163,736
Int. Cl. C22b 7/00
U.S. Cl. 75—63 8 Claims

A novel pyrolysis process system for recycling of refuse wherein refuse is fed into a closed retort. The closed retort includes a moving molten lead bath for accomplishing the pyrolysis of the refuse. The pyrolysis process converts the organic portions of the refuse to a vapor state to facilitate ultimate recovery of tars, oils and other petroleum-related products, a part of which includes fuel that may be utilized to operate the system. The non-organic portions of the refuse are ultimately separated into high grade char, ferrous metals, non-ferrous metals and precious metals. The pyrolysis process exhausts no gases into the atmosphere and allows virtually all components of the refuse to be recycled into usable products.

3,770,420
MELTING ALUMINUM UNDER SPECIAL FLOW CONDITIONS

Robert E. Spear, Murrysville; Robert J. Ormesher, Leechburg, and Herbert M. Short, Pittsburgh, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed July 29, 1971, Ser. No. 167,205
Int. Cl. C22b 21/00
U.S. Cl. 75—68 R 11 Claims

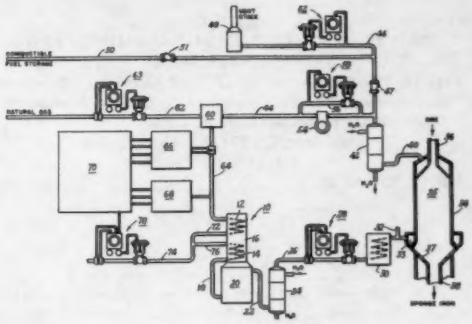


Solid aluminum charge is melted by contact with superheated molten aluminum in a charging bay or compartment. The molten aluminum is heated in a separate bay wherein special flow conditions are maintained to improve the rate of heat input to the melt. The temperatures exiting the heating and charging bays are also controlled.

3,770,421
METHOD AND APPARATUS FOR CONTROLLING THE COMPOSITION OF A REDUCING GAS USED TO REDUCE METAL ORES

Juan Celada; Patrick W. MacKay; Gilberto Guerra Garcia; Enrique R. Martinez, and Antonio Villasenor, all of Monterrey, N.L., Mexico, assignors to Fierro Esponja, S.A., Monterrey, Mexico

Filed Nov. 22, 1971, Ser. No. 200,721
Int. Cl. C22b 5/12; C21b 13/14
U.S. Cl. 75—91 14 Claims



Apparatus and method are described for controlling the addition of steam to recycled gas circulating in a closed loop including the reduction zone of a reactor and a catalytic reformer of a system for gaseous reduction of particulate metal ores to metal wherein the recycled gas is measured to determine flow rate and gaseous composition and the measurements are utilized in an electronic circuit to generate an input signal for a steam controller.

3,770,422
PROCESS FOR PURIFYING EU AND YB AND FORMING REFRACTORY COMPOUNDS THEREFROM

Alfred J. Darnell, Woodland Hills, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed June 11, 1971, Ser. No. 152,321
Int. Cl. C22b 59/00; C01f 17/00
U.S. Cl. 75—103 10 Claims

Europium and ytterbium are obtained in a highly purified and reactive state by dissolving these rare earth metals in liquid ammonia to form an ammoniate complex, and then recovering the metals by low-temperature decomposition of the ammoniate complex and complete removal of the ammonia solvent. Preferably the dissolution of these metals in liquid ammonia is performed under reflux conditions, ammonia-insoluble impurities being removed by filtration prior to the low-temperature recovery of the metals from the liquid ammonia in an inert atmosphere.

The so-obtained highly purified europium and ytterbium are recovered in a finely divided chemically active state and readily react with the chalcogens of group VI A and the pnictogens of group V A of the Periodic Chart to form the refractory chalcogenides and pnictogenides of these metals. Preferably the reaction of the rare earth metals with the chalcogens and pnictogens is accomplished using a solid-gas phase reaction at elevated temperatures.

3,770,423

PROCESS FOR REMOVING DISSOLVED LEAD COMPOUNDS FROM AQUEOUS MEDIA

Carlos Lores, Hancocks Bridge, N.J., and Ralph Bishop Moore, New Castle, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 4, 1972, Ser. No. 223,766
Int. Cl. C22b *3/00*
U.S. Cl. 75—108 9 Claims

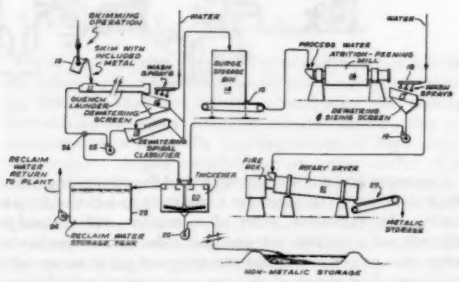
Process for treating an aqueous medium containing dissolved organic and inorganic lead compounds, for example, aqueous effluent from the manufacture of tetraalkyl lead, with an alkali metal borohydride to substantially reduce the level of dissolved lead in the aqueous medium.

3,770,424

PROCESS FOR RECOVERY OF ALUMINUM FROM FURNACE SKIM

Paul H. Floyd, Danville, Calif., and George J. Binczewski, Ravenswood, W. Va., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Sept. 7, 1971, Ser. No. 178,304
Int. Cl. C22b *21/00*
U.S. Cl. 75—68 R 10 Claims



A process for recovering metal values from furnace skim comprising a controlled wet comminution of the skim at a reduced work input level in a ball mill having a ball charge of from 5 to 20 percent of the internal mill volume. The comminuted product is separated into a coarse and fine fraction, the coarse fraction being substantially metal and the fine fraction being substantially non-metals such as oxides, nitrides, and the like.

3,770,425

WELDING ELECTRODE FOR CONTINUOUS WELDING

Alexandr Mikhailovich Belenky, ulitsa Lyadovo, 9, kv. 129, Kazan; Viktor Evgenievich Lazko, 10 Prospekt, 27a, kv. 23, Moscow; Alexandr Mikhailovich Toschev, ulitsa Gagarina, 63, kv. 80, Kazan; Ilgiz Ganeevich Bikmametov, Shkolny pereulok, 2, kv. 14, Kazan; Vladimir Kirillovich Vilkov, ulitsa Proizvodstvennaya, 12, kv. 18, Kazan; Nikolai Alexandrovich Mosendz, ulitsa Filatova, 1/22, kv. 16, Kiev; Galina Mikhailovna Yakushina, ulitsa Komsomolskaya, 25, kv. 42, Reutovo, and Mikhail Vasilievich Poplavko-Mikhailov, Maly Pionersky pereulok, 5, kv. 156, Moscow, all of U.S.S.R.

Filed July 15, 1971, Ser. No. 163,053
Int. Cl. C22c *39/20*
U.S. Cl. 75—128 A 1 Claim

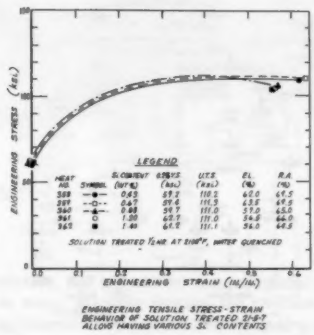
A continuous welding electrode for welding low- and medium-alloyed high-strength steels which comprises in percent by weight carbon 0.18–0.25, manganese 2.5–3.5, silicon 0.4–0.8, chrome 1.5–2.0, nickel 1.0–1.3, tungsten 0.9–1.3, molybdenum 0.4–0.5, balance iron and provides for making high-strength weld joints having high impact strength at a temperature of up to −100°C.

3,770,426

COLD FORMABLE VALVE STEEL

Richard A. Kloske, Parma Heights, and William F. Barclay, Berea, both of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 607,406, Jan. 5, 1967. This application Sept. 17, 1971, Ser. No. 181,399
Int. Cl. C22c *39/20*
U.S. Cl. 75—128 A 18 Claims


ENGINEERING STRESS (ksi)
LEGEND
HEAT NO. SYMBOL C(wt%) 0.2%Y.S. (ksi) U.T.S. (ksi) EL. (%) R.A. (%)
369 0.43 69.2 110.2 62.0 69.5
389 0.67 89.6 111.5 43.5 69.5
360 0.88 96.7 111.0 57.0 65.0
961 1.00 60.0 111.0 56.0 66.0
962 1.40 64.0 111.1 56.0 64.5
SOLUTION TREATED 1 HR. AT 2100°F, WATER QUENCHED
ENGINEERING STRAIN (in/in)

ENGINEERING TENSILE STRESS-STRAIN BEHAVIOR OF SOLUTION TREATED 5Cr-8Ni ALLOYS HAVING VARIOUS C CONTENTS

Cold formable, age hardenable, valve steel consisting essentially of 19–23% chromium, 4–6.5% nickel, 6.5–8% manganese, 0.15–0.30% each of carbon and nitrogen, up to 1% silicon, up to 0.2% columbium, up to 0.1% each of phosphorous and sulfur, balance iron, characterized as solution treated by low yield strength of under 75 ksi, low hardness of about 10–20 Rockwell "C" and high ductility, and being formable thence at temperatures below recrystallization into engine poppet valves and being age hardenable thence to maintain high ambient and elevated temperature hardnesses, high creep-rupture strength and low creep deformation, the steel having high corrosion resistance to leaded fuel exhaust gases, particularly at silicon contents of 0.2% and under.

3,770,427

WELDING MATERIAL

Walter Adrian Petersen, Ridgewood, N.J., assignor to The International Nickel Company, Inc., New York, N.Y.

Filed Jan. 27, 1972, Ser. No. 221,400
Int. Cl. C22c *19/00*
U.S. Cl. 75—171 6 Claims

A consumable welding material particularly suitable for welding products nominally containing nickel-28% chromium-10% iron, comprising, by weight, about 27% to 31.5% chromium, about 5% to 14% iron, about 0.5% to 1.1% aluminum, about 0.1% to 0.7% titanium, about 0.02% to 0.08% carbon, up to about 0.1% magnesium, up to about 0.010% nitrogen and the balance nickel and incidental elements.

The welding material provides substantially sound, corrosion-resistant weld deposits.

3,770,428

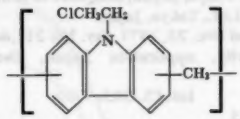
PHOTOCONDUCTIVE REACTION PRODUCT OF N-BETA-CHLORETHYL CARBAZOLE AND FORMALDEHYDE

Syu Watarai, Tokyo, and Hisatake Ono, Asakashi, both of Japan, assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 23, 1971, Ser. No. 174,272
Claims priority, application Japan, Aug. 25, 1970, 45/74489
Int. Cl. G03g *5/06*
U.S. Cl. 96—1.5 13 Claims

A xerographic plate including a resinous organic photoconductive composition obtained from the reaction between n-

beta-chloroethyl carbazole and formaldehyde satisfying the formula:



and an electrophotographic process employing the same.

3,770,429

METHOD FOR REMOVING CORONA DISCHARGE CONTAMINANTS IN ELECTROPHOTOGRAPHY

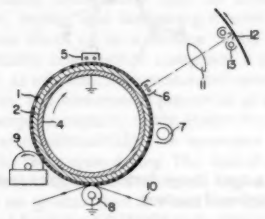
Koichi Kinoshita, Narashino; Shiro Uehara, Tokyo; Hiroshi Nagame, Tokyo, and Kazukiyo Yamada, Tokyo, all of Japan, assignors to Katsuragawa Denki Kabushiki Kaisha, Tokyo-to, Japan

Filed Sept. 13, 1971, Ser. No. 179,805

Claims priority, application Japan, Sept. 25, 1970, 45/83391

Int. Cl. G03g *13/18, 13/22*

U.S. Cl. 96—1 R 9 Claims



In a method and apparatus for electrophotography in which use is made of photosensitive element including a photoconductive layer and an image forming surface which may be the surface of the photoconductive layer or the surface of a highly insulative layer integrally bonded to the surface of the photoconductive layer and wherein an electric charge is deposited on the image forming surface by means of corona discharge, a light image is projected upon the photosensitive element to form a latent image on the image forming surface, and the latent image is transfer printed onto a recording medium, means is provided to apply an organic solvent to the image forming surface to remove contaminants formed by the ionization of air by the corona discharge.

3,770,430

PHOTOELECTROSOLOGRAPHIC IMAGING PROCESS

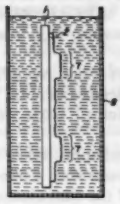
Joseph Mammino, Penfield, N.Y., and Gail D. Jvirblis, Mountain View, Calif., assignors to Xerox Corporation, Rochester, N.Y.

Division of Ser. No. 857,429, Sept. 12, 1969, Pat. No. 3,677,750, and a continuation-in-part of Ser. No. 553,836, May 31, 1966, abandoned. This application Dec. 20, 1971, Ser. No. 210,286

Int. Cl. G03g *5/06, 13/00*

U.S. Cl. 96—1 R 11 Claims

A photoelectrosolographic imaging system utilizing a plate overcoated with a soluble layer. An image is formed on the plate by forming an electrostatic latent image on the surface and treating the surface with a solvent for the soluble layer



whereby the layer dissolves away selectively in the uncharged areas.

3,770,431

PHOTOGRAPHIC ELEMENTS CONTAINING BALLASTED RESORCINOLS

John Warburton Gates, Jr., and Ilmari Fritiof Salminen, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 16, 1971, Ser. No. 181,262

Int. Cl. G03c *5/54, 7/00*

U.S. Cl. 96—29 D 15 Claims

Photographic elements are disclosed which comprise a support and at least one layer thereon containing a ballasted resorcinol. In one embodiment, the ballasted resorcinols are utilized as scavengers for development reaction by-products or contaminants. The ballasted resorcinols are especially useful for scavenging oxidized color developers.

3,770,432

A PHOTOGRAPHIC COMPOSITION OF 1,1-BIS-SULFONYL ALKANE AND HYDROXYLAMINE

Donald G. Yungkurth, and Gary J. McSweeney, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 1, 1971, Ser. No. 185,830

Int. Cl. G03c *5/54*

U.S. Cl. 96—29 R 13 Claims

A combination of 1,1-bis-sulfonyl alkane silver halide solubilizing agent with a hydroxylamine silver halide developing agent in a photographic chemical transfer process, element, composition and/or product provides a developed image having increased stability, with low minimum density, increased maximum density and desired sensitometric properties. This combination can include addenda commonly employed in photographic processing compositions and elements.

3,770,433

HIGH SENSITIVITY NEGATIVE ELECTRON RESIST

John Lester Bartelt, Summit, and Eugene David Feit, Berkeley Heights, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 22, 1972, Ser. No. 237,048

Int. Cl. G03c *5/00*

U.S. Cl. 96—36 6 Claims

A technique is described for the generation of a relief image in a sensitive negative electron resist based upon a modified polymer of glycidyl methacrylate alone or in combination with methyl methacrylate and/or ethyl acrylate. The described resist evidences optimum characteristics with respect to sensitivity, adhesion and resolution and is suitable for use as an etch mask in the fabrication of microelectronic devices.

3,770,434

METHOD FOR MAKING AN IMAGE SCREEN STRUCTURE FOR AN APERTURED-MASK CATHODE-RAY TUBE USING A MASK HAVING TEMPORARY APERTURES

Harold Bell Law, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 872,978, Oct. 31, 1969, abandoned. This application Oct. 15, 1971, Ser. No. 189,530

Int. Cl. G03c *5/00*

U.S. Cl. 96—36.1 **18 Claims**

Each of the final-sized apertures of an apertured-mask for a cathode-ray tube is closed with a film of an organic material. The central portion of the film closing each final-sized aperture is then opened so as to provide a temporary aperture smaller than the final-sized aperture. An image-screen structure is then photodeposited using the mask with the smaller temporary apertures as a photographic master. After the screen structure is deposited, the organic material is removed to restore the permanent mask with the larger final-sized apertures therein for use in the cathode-ray tube.

3,770,435

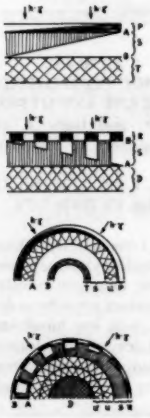
PRODUCTION OF GRAVURE PRINTING PLATES BASED ON PLASTICS MATERIALS

Otto Volkert, Ludwigshafen, and Manfred Zuerger, Mannheim, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhine, Germany

Filed Dec. 8, 1971, Ser. No. 205,857

Int. Cl. G03f *5/00, 7/00*

U.S. Cl. 96—45 **8 Claims**



A process for the production of gravure printing plates by exposing through a continuous tone positive a layer of a photocrosslinkable material that is soluble in a developer solution but which becomes sparingly soluble or insoluble in said solution after exposure, which layer has been applied to a dimensionally stable substrate, subsequently laminating the exposed layer to a base so that the side originally facing the positive faces the base, re-exposing said laminated layer through a screen and washing out the non-crosslinked areas with the developer solution from the rear side.

Tonally correct gravure printing plates based on plastics materials can be advantageously obtained by the process of the invention.

3,770,436

PROCESS FOR FORMING CYAN IMAGE IN LIGHT-SENSITIVE COLOR PHOTOGRAPHIC MATERIAL

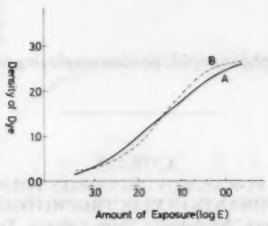
Mitsuto Fujiwhara; Ryosuke Sato; Tadaaki Koga, and Shunji Matsuo, all of Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Dec. 23, 1971, Ser. No. 211,469

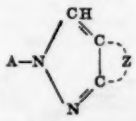
Claims priority, application Japan, Dec. 26, 1970, 45/119054

Int. Cl. G03c *7/00*

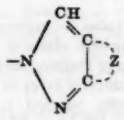
U.S. Cl. 96—56.5 **3 Claims**



A process for forming a cyan image in a light-sensitive color photographic material, characterized in that a light-sensitive color photographic material having a silver halide emulsion layer incorporated with a compound of the formula



wherein A is a cyan image-forming coupler residue having an α-naphthol or phenol nucleus;



is a group bonded to the p-position of the hydroxyl group of A; and Z is an atomic group necessary for forming an indazolyl group, is exposed to light imagewise and subjected to color development, or a light-sensitive color photographic material is exposed to light imagewise and subjected to color development using a color developer incorporated with the compound of the above-mentioned formula, thereby forming a cyan image corresponding to the silver image formed in the photographic material.

3,770,437

PHOTOGRAPHIC BLEACH COMPOSITIONS

Donald J. Brugger, and Barry R. Hagenbuch, both of 1669 Lake Ave., Rochester, N.Y.

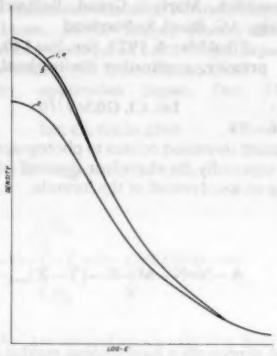
Filed Apr. 6, 1972, Ser. No. 241,592

Int. Cl. G03c *5/32, 7/16, 5/50*

U.S. Cl. 96—60 R **12 Claims**

The incorporation of bromate ion into photographic bleach

compositions which include trivalent iron complexes of aminopolycarboxylic acid as the bleaching agent inhibits the



formation of leuco cyan dyes when these bleaches are used in the processing of incorporated coupler reversal emulsions.

3,770,438

PHOTOPOLYMERIZABLE TRANSFER ELEMENTS

Jack Richard Celeste, 40 Cameron Ct., Freehold, N.J.

Continuation-in-part of Ser. No. 78,181, Oct. 5, 1970, abandoned. This application Dec. 9, 1971, Ser. No. 206,532

Int. Cl. G03c *1/12*

U.S. Cl. 96—67 **10 Claims**

A photopolymerizable film element is made by coating a photopolymerizable composition onto an actinically transparent support, drying, and laminating it with a temporary protective cover sheet or to a surface to be imaged. The photopolymerizable composition comprises a mixture of an organic binder, an ethylenically unsaturated monomer, and an initiating system. The monomer is present in an amount in excess of the absorptive capacity of the binder for monomer, so that a thin layer of substantially free monomer forms on the monomer-binder layer upon drying. The optical density of the photopolymerizable layer, in the actinic region of the exposure, must be no greater than 0.7 and the thickness of the dried layer must be at least 0.00005 inch. The support for the photopolymerizable composition must have greater adhesion to the unexposed photopolymerizable layer than that exhibited by the cover sheet, and less adhesion to the exposed photopolymer layer than that exhibited by the cover sheet or the surface to be imaged.

3,770,439

POLYMERIC MORDANT IN COLOR DIFFUSION TRANSFER IMAGE RECEIVING LAYER

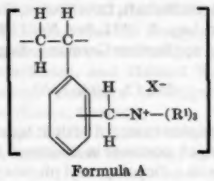
Lloyd D. Taylor, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 3, 1972, Ser. No. 215,082

Int. Cl. G03c *1/40*

U.S. Cl. 96—77 **13 Claims**

A photographic product having an image pattern receiving layer which comprises a polymer of the formula:



Formula A

where each R^1 can be the same or different substituent chosen from the group consisting of hydrogen, alkyl, alkoxy and alkanol and X^- is an anion radical.

3,770,440

SPECTRALLY SENSITIZED PHOTOGRAPHIC SILVER HALIDE EMULSION

Akira Sato; Keisuke Shiba, and Masanao Hinata, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

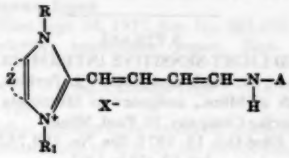
Filed June 2, 1971, Ser. No. 149,276

Claims priority, application Japan, June 2, 1970, 45/47381

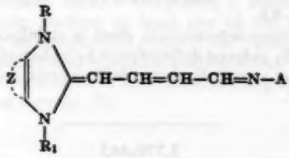
Int. Cl. G03c *1/10*

U.S. Cl. 96—139 **6 Claims**

A photographic silver halide emulsion containing at least one sensitizing dye represented by the formula (I) or (II):



(I)



(II)

wherein Z represents an atomic group necessary to complete a benzene ring, the hydrogen atom of which may be substituted; R and R_1 each represent a member selected from the group consisting of the same or different alkyl groups and a substituted alkyl group except a sulfoalkyl group; and A represents an aryl group and X represents an acid anion.

3,770,441

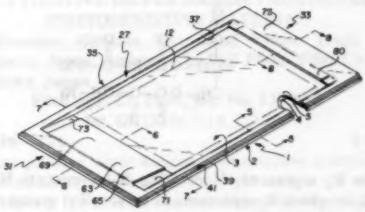
SELF-PROCESSING FILM UNIT WITH A REMOVABLE PROCESSING COMPOSITION SUPPLYING MEANS

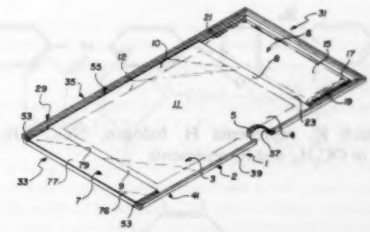
Donald M. Harvey, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 1, 1971, Ser. No. 111,403

Int. Cl. G03c *1/48*

U.S. Cl. 96—76 C **16 Claims**





A photographic film unit of the self-processing type includes a preregistered, integral image-recording unit sup-

ported on a rigid frame. The recording unit is strippably coupled to the frame and also to a cooperating pod and trap, respectively, for supplying a processing composition to the recording unit and for collecting any excess of the composition from the recording unit. Stripping of the recording unit from the frame, pod and trap is most effectively accomplished by one or more stripping fingers of related photographic apparatus, that are adapted to be inserted between the recording unit and the frame to separate the recording unit from the frame, pod and trap. The finished print is constructed in the recording unit, and, after the above-mentioned stripping, is substantially unencumbered by other elements of the film unit necessary only for processing.

3,770,442

STABILIZED LIGHT-SENSITIVE INTERMEDIATE SHEET

Leo A. Meyer, St. Paul, and Robert J. Perkins, White Bear Lake, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 15, 1971, Ser. No. 189,752

Int. Cl. G03c *1/92*

U.S. Cl. 96—82 **9 Claims**

Light-sensitive intermediate sheet is stabilized against atmospherically induced deterioration by including in said intermediate sheet a normally non-volatile organic aromatic amine preservative.

3,770,443

PHOTOSENSITIVE COMPOSITION COMPRISING A PHOTOSENSITIVE POLYMER

Chiaki Osada; Masato Satomura, and Hisatake Ono, all of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

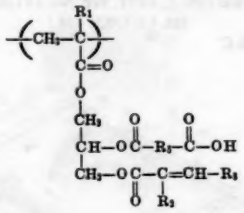
Filed June 16, 1972, Ser. No. 263,577

Claims priority, application Japan, June 16, 1971, 46/43052

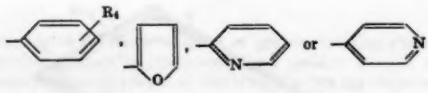
Int. Cl. G03c *1/68, 1/70*

U.S. Cl. 96—86 P **9 Claims**

A photosensitive composition comprising as the main photosensitive component a high molecular weight compound containing therein repeating units of the following general formula



wherein R_1 represents H or CH_3, R_2 represents H, CN or COOR, in which R represents H or an alkyl group of 1 to 6 carbon atoms; R_3 represents



in which R_4 represents H, halogen, NO_2, CH_3, C_2H_5, OCH_3 or OC_2H_5; and R_5 represents

—CH=CH— or $—CH_2—CH_2—$.

3,770,444

PHOTOGRAPHIC SILVER HALIDE LIGHT-SENSITIVE MATERIAL CONTAINING AZO DYES

Alfred Froehlich, Marly-le-Grand, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed May 4, 1971, Ser. No. 140,302

Claims priority, application Switzerland, May 5, 1970, 6686/70

Int. Cl. G03c *1/10*

U.S. Cl. 96—99 **8 Claims**

The present invention relates to photographic light-sensitive material, especially for the silver dyestuff bleaching process, containing an azo dyestuff of the formula

$$A—N=N—M—X—(Y—Z)_{n-1}—Q$$

in which A represents a naphthalene residue containing 1 to 2 sulphonic acid groups or sulphonic acid amide groups, bonded in the 1 position to the azo group, in the 2 position to a possibly substituted amino group and in the 8 position to a group or in the 2 position to the azo group, in the 8 position to a possibly substituted amino group and in the 1 position to a hydroxyl group, M stands for a possibly substituted benzene residue and Y for a possibly substituted benzene, diphenyl, diphenylsulphon or di-(phenylamino)-acylic residue, X stands for —O—, —S—, —SO—, $—SO_2—$, —CO— or —NR— and Z stands for —CO—, —S—, —SO—, $—SO_2—$, —CO—, $NR_1—$, $—Cl—NR_1—$, $NR_1—CO—$, $—SO_2—NR_1$ or $—NR_1—SO_2$, in which R and R_1 represent a hydrogen atom or a low alkyl residue, in which $n = 1$ or 2 and Q stands for a possibly substituted heterocyclic residue, alkyl or benzene residue or a residue of the formula

$$—D—N=N—E$$

in which D represents a possibly substituted benzene or naphthalene residue and E has the meaning which is stated in respect of A. These dyestuffs are magenta dyestuffs, preferably image dyestuffs in silver dyestuff bleaching material.

3,770,445

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL CONTAINING COUPLERS SUBSTITUTED WITH DICYCLOPENTYL PHENOXY GROUPS

Willibald Pelz, Cologne-Dellbruck; Hans-Heinrich Credner, Hohenschaftlarn; Walter Schulte, Opladen; Alfons Klein, Dusseldorf; Karlfried Wedemeyer, and Fritz Nittel, both of Cologne-Stammheim, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 4, 1971, Ser. No. 169,146

Claims priority, application Germany, Aug. 8, 1970, P 20 39 489.2

Int. Cl. G03c *1/40*

U.S. Cl. 96—100 **5 Claims**

A colorphotographic material with at least one silver halide emulsion layer which contains in dispersed form a color coupler substituted with a dicyclopentyl phenoxy group. This substitution lowers the melting point of the coupler and increases its solubility in solvents used to incorporate the couplers in photographic layers. Layers with these couplers are accordingly more stable.

3,770,446

COLOR PHOTOGRAPHIC SILVER HALIDE MATERIAL CONTAINING ACETANILIDE COUPLERS

Shui Sato; Teruo Hanzawa; Masaaki Furuya; Takaya Endo, and Isaburo Inoue, all of Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

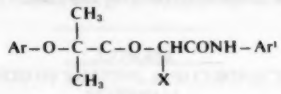
Filed Dec. 1, 1971, Ser. No. 203,882

Claims priority, application Japan, Dec. 18, 1970, 45/113101

Int. Cl. G03c *1/40*

U.S. Cl. 96—100 4 Claims

A yellow coupler of the general formula:



wherein Ar and Ar' are an aryl group and X is hydrogen or a group capable of being released at the time of color development, is produced which is high in coupling reactivity, have spectral absorption characteristics suitable for the color reproduction principle of the tricolor substractive color photography and form dye images which are stable to heat, light and humidity.

3,770,447

LIGHT-SENSITIVE SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL CONTAINING INDAZOLONE COUPLERS

Immo Boie, Cologne; Walter Schulte, Opladen; Willibald Pelz, Cologne; Heinrich Krimm, Krefeld-Bockum; Dieter Freitag, Krefeld, and Fritz Nittel, Cologne, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

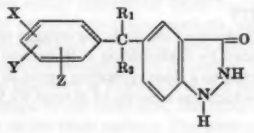
Filed Dec. 29, 1971, Ser. No. 213,814

Claims priority, application Germany, Dec. 29, 1970, P 20 64 304.3

Int. Cl. G03c *1/40*

U.S. Cl. 96—100 8 Claims

A light-sensitive photographic material with at least one silver halide emulsion layer which contains indazolone derivatives as couplers for the production of the magenta partial image, which indazolone couplers are represented by the following formula:



wherein
the radicals R_1, R_2, X, Y and Z are denoted in the description.

3,770,448

LIGHTSENSITIVE PHOTOGRAPHIC MATERIAL

Albert Lucien Poot; Frans Clement Heugebaert, both of Kontich; Eric Maria Brinckman, Mortsel, all of Belgium; Anita Von Kunig, Leverkusen, and Helmut Kampfer, Cologne, both of Germany, assignors to Afga-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 26, 1971, Ser. No. 137,604

Claims priority, application Germany, Apr. 29, 1970, P 20 20 939.6

Int. Cl. G03c *1/02, 5/30*

U.S. Cl. 96—114.1 8 Claims

Photographic images are obtained by a dry process by imagewise exposing and then heating a light-sensitive material containing a substantially non-lightsensitive silver salt, a compound of the pyrazolin-5-on series capable of reducing the silver salt at a temperature of between 60° and 160° C in the presence of photolytically formed heavy metal nuclei and a light-sensitive silver or other heavy metal compound capable of forming such nuclei upon exposure to light.

3,770,449

SPECTRALLY SENSITIZED SILVER HALIDE PHOTOGRAPHIC EMULSION

Keisuke Shiba; Haruo Takei; Akira Sato, and Tadashi Ikeda, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

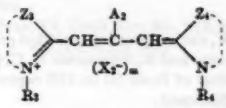
Filed Sept. 24, 1971, Ser. No. 183,492

Claims priority, application Japan, Sept. 24, 1970, 45/83653

Int. Cl. G03c *1/14*

U.S. Cl. 96—124 5 Claims

A silver halide photographic emulsion containing a supersensitizing combination of at least one carbocyanine dye having a heterocyclic necleus comprising a benzothiazole or benzoselenazole nucleus, at least one of the heterocyclic nuclei having an acetylamino group at the 5-position thereof, and having a sensitized maximum portion within the range of from 600 to 660 nm, and at least one sensitizing dye of the following general formula (II)



wherein R_3 and R_4 each represents a lower alkyl group; A_2 represents a lower alkyl group or an aryl group; Z_3 and Z_4 each represents an atomic group necessary to complete a benzothiazole, benzoselenazole or β-naphthothiazole nucleus; X_3^- represents an anion; and m is 0 or 1, m being 0 when an intermolecular salt is formed.

3,770,450

DIRECT POSITIVE SILVER HALIDE PHOTOGRAPHIC PHOTOSENSITIVE MATERIAL

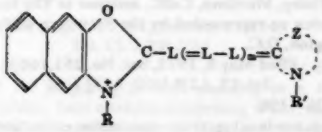
Hideo Kawano; Hirotetu Kato, and Nobuo Tsuji, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 27, 1971, Ser. No. 137,970

Int. Cl. G03c *1/14, 1/72*

U.S. Cl. 96—126 5 Claims

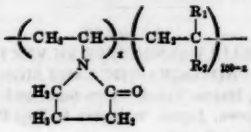
A direct positive silver halide photosensitive material containing in its silver halide emulsion layer and/or the adjacent layer(s) thereof (1) at least one sensitizing dye represented by the following general formula I:



(I)

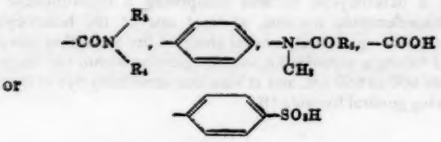
wherein R and R' are each an alkyl or a substituted alkyl group, L is a methine chain, Z represents the group of atoms necessary to form a five or six membered nitrogen-containing

heterocyclic nucleus, X is an anion and *n* is 0 or 1, and (2) at least one water-soluble (high) polymer having repeating units represented by the following general formula II:



(II)

wherein R_1 is H or CH_3, R_2 is -OH, -$OCOR_3$, -$COOR_3$, -CN, -$CONH_2$, -$CONHR_3$,



in which R_3 and R_4 each represents an alkyl group of from one to four carbon atoms and R_5 represents H, CH_3 or C_2H_5, and x is a positive number of from 50 to 100 representing the percentage ratio, is disclosed.

3,770,451

SILVER HALIDE EMULSIONS SENSITIZED WITH DYES CONTAINING HETEROCYCLIC NITROGEN ATOMS SUBSTITUTED WITH AN -OR GROUP

Philip W. Jenkins; Donald W. Heseltine, and John D. Mee, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 766,307, Oct. 9, 1968. This application Jan. 13, 1971, Ser. No. 106,231

Int. Cl. G03c *1/18, 1/22*

U.S. Cl. 96—135 **14 Claims**

A class of energy-sensitive compounds containing heterocyclic nitrogen atoms substituted with an -OR group fragment under the influence of various forms of energy to form a dye base, a proton and an aldehyde, these materials being useful in image reproduction.

3,770,452

BEVERAGES CONTAINING DEAMIDIZED GLUTEN

John W. Finley, Martinez, Calif., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed May 8, 1972, Ser. No. 251,166

Int. Cl. A23l *1/00*; A23j *1/12*

U.S. Cl. 426—190 **5 Claims**

Native gluten is subjected to successive extractions with anhydrous isopropanol, aqueous alkali isopropanol, and aqueous acidic isopropanol to remove astringent principles. The gluten is then hydrolyzed with dilute acid to convert amide groups to carboxy groups. The non-astringent deamidized gluten is incorporated in beverages including acidic beverages such as fruit juices.

3,770,453

STABILIZATION OF FERMENTED MALT BEVERAGES

Miroslav Dadic, Montreal; Joris E. A. Van Gheluwe, Longueuil, Montreal, and Zoltan Valyi, Montreal, Quebec, all of Canada, assignors to Molson Industries Limited, Toronto A.M.F., Ontario, Canada

Filed Apr. 22, 1971, Ser. No. 136,568

Int. Cl. C12h *1/04*

U.S. Cl. 426—227 **7 Claims**

The colloidal and flavor stability of fermented malt beverages are improved by adding to the beverage quercetin or compositions produced by the absorption of components from a fermented malt beverage such as beer on nylon and recovering the components from the adsorbate.

3,770,454

CHILLPROOFING OF FERMENTED MALT BEVERAGES

Irwin M. Stone, Staten Island, N.Y., assignor to Baxter Laboratories, Inc., Morton Groves, Ill.

Continuation-in-part of Ser. No. 139,946, May 3, 1971. This application Dec. 21, 1971, Ser. No. 210,512

Int. Cl. C12h *1/12*

U.S. Cl. 426—12 **4 Claims**

A method and composition for chillproofing fermented malt beverages, to improve storage stability and to prevent the development of hazes and turbidities in the finished packaged beer, comprising the combined use of the growth products of certain mold microorganisms containing decomplexing enzymes for the protein-tannin complex system and at least one substance from the group consisting of the alkali metal sulfite salts and the alkali metal and alkaline earth metal ascorbate salts.

3,770,455

PRODUCTION OF CARBONATED BEVERAGES

Joris E. A. Van Gheluwe, and Miroslav Dadic, both of Montreal, Quebec, Canada, assignors to Molson Industries Limited, Toronto A.M.F., Ontario, Canada

Filed Mar. 31, 1971, Ser. No. 129,790

Int. Cl. C12g *1/06, 3/00*

U.S. Cl. 426—477 **5 Claims**

Carbonated fermented alcoholic beverages of increased stability are produced by carbonating with carbon dioxide which has been subjected to a deoxygenating agent to remove traces of oxygen, and which has a purity of at least 99.98 percent.

3,770,456

PROCESS FOR THE REMOVAL OF UNDESIRABLE IRRITANTS FROM RAW COFFEE BEANS

Wilhelm Roselius, Bremen-St. Magnus; Otto Vitzthum, Bremen, and Peter Hubert, Bremen-Lesum, all of Germany, assignors to HAG Aktiengesellschaft, Bremen, Germany

Filed Oct. 6, 1971, Ser. No. 187,168

Int. Cl. A23f *1/04*

U.S. Cl. 426—354 **8 Claims**

Process for the removal of undesirable irritants from raw coffee beans without concommitant reduction in caffeine content by extraction with organic solvents which comprises extracting the raw beans with a water-immiscible, low boiling organic solvent for a period of from about 0.75 to 4 hours at a temperature which is above the boiling point of the solvent but no higher than about 80° C.

3,770,457
METHOD OF MAKING PELLETIZED COFFEE PERCOLATOR PACKAGE

John A. Makwinski, Garfield; Warren C. Rehman, and Clifford H. Spotholz, both of Montvale, all of N.J., assignors to General Foods Corporation, White Plains, N.Y.

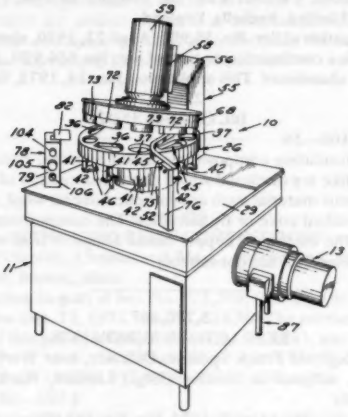
Filed Apr. 19, 1972, Ser. No. 245,395
Int. Cl. A23f 1/00; B65b 29/02
U.S. Cl. 426—394 **5 Claims**

Roasted and ground coffee is degassed, then heated to a temperature of from 90° F to about 110° F prior to being compressed to form a pellet which is then packaged in a porous filter material. The resulting package has an improved availability of soluble solids over comparable products prepared from unheated roasted and ground coffee.

3,770,458
METHOD OF SHAPING AND COMPACTING MATERIAL

Donald W. Garnett, Grand Ledge, Mich., assignor to Mahogany Farms, Inc., Williamston, Mich.

Division of Ser. No. 875,267, Nov. 10, 1969, Pat. No. 3,647,343. This application Dec. 23, 1971, Ser. No. 211,813
Int. Cl. A22c 18/00
U.S. Cl. 264—294 **3 Claims**



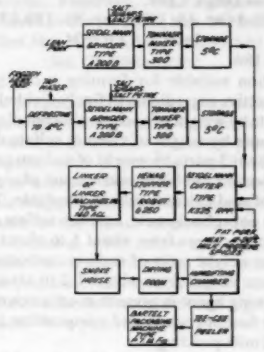
A motor driven rotary compactor table carries a circumferential series of material-receiving pockets, each bottomed by an ejector cam-operated during the table rotation to eject a shaped and compacted product from its pocket. A compactor plate of the same diameter is journaled above the table on an axis at an acute angle to the table axis, and theoretically intersecting the latter at the table surface. The plate carries an annual series of compactor plungers equal in number and circumferential spacing to the table pockets, and the inclination and vertical relationship of table and plate to one another are such that the plungers enter into the respective table pockets at the apex of an acute angle theoretically defined by planes of the convergent, mutually facing plate and table surfaces. Thus, in compacting material in the pockets, the plungers also effect a cog and wheel-like drive of the compactor plate.

3,770,459
PROCESS FOR PREPARING SKINLESS DRY SAUSAGE AND PRODUCT PRODUCED THEREBY

David Barend Gast, Kapellen, Belgium, assignor to Lever Brothers Company, New York, N.Y.

Filed Jan. 13, 1971, Ser. No. 106,065
Int. Cl. A22c 11/00
U.S. Cl. 426—8 **2 Claims**

The invention relates to a novel food form comprising a skinless dry sausage having specified form weight, dimensions and water content. The invention also includes a process for making this skinless sausage wherein the sausage is subjected

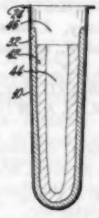


to defined humidity conditions prior to skinning it, and packages of such sausages in airtight containers, wherein the enclosed atmosphere has a low oxygen content.

3,770,460
METHOD OF PRODUCING A MOLDED FROZEN BODY

Robert H. Vroman, Toledo, Ohio, assignor to Vroman Foods, Inc., Toledo, Ohio

Filed Nov. 13, 1969, Ser. No. 876,493
Int. Cl. A23g 5/02
U.S. Cl. 426—279 **10 Claims**



The disclosure embraces a method of making a novel frozen product wherein the edible constituents in liquid or flowable condition are successively introduced into a mold and subjected to reduced temperatures or subfreezing conditions controlled to freeze portions of the liquid constituents including displacing a quantity of an unfrozen constituent with a liquid constituent of lesser specific gravity to provide layers or bodies of the edible constituents in contiguous relation in the frozen confection.

3,770,461
PREPARATION OF A FRUIT PUDDING

Aubrey P. Stewart, Jr., and Clarence R. Dreier, Jr., both of Corning, Iowa, assignors to Allied Chemical Corporation, New York, N.Y.

Filed Aug. 27, 1971, Ser. No. 175,741
Int. Cl. A23l 1/14
U.S. Cl. 426–380 **5 Claims**

A method for preparing a fruit pudding in a two-step process. A pudding base mixture comprising water, sugar and starch is blended together into a homogeneous mix and thereafter sterilized. Separately, an edible acid-flavoring base is prepared and separately sterilized. The separately sterilized pudding base and acid-flavoring mixture are thereafter mixed together to form a fruit pudding. The pudding is aseptically canned.

3,770,462

COLD MILK CUSTARD-TYPE PUDDING

Harry R. Schuppner, Jr., El Cajon, Calif., assignor to Kelco Company, San Diego, Calif.

Filed Oct. 18, 1971, Ser. No. 189,833
Int. Cl. A23l *1/04*
U.S. Cl. 426—186 **10 Claims**

A composition suitable for forming a cold milk pudding containing as active ingredients in finely divided form about 2 to about 8 parts by weight of sodium phosphoalginate, about 1 to about 4.5 parts by weight of calcium sulfate dihydrate, and about 0.5 to about 3 parts by weight of sodium carbonate in an amount sufficient to solubilize said sodium phosphoalginate in the presence of said calcium sulfate dihydrate. The total content of sodium phosphoalginate, calcium sulfate dihydrate and sodium carbonate ranges from about 5 to about 12.5 parts by weight and the weight ratio of sodium carbonate to calcium sulfate dihydrate ranges from about 1:2 to about 1:4, and an edible antifoaming agent is present in an amount sufficient to prevent undue foaming when said composition is employed in forming a cold milk pudding.

A composition for forming a cold milk pudding containing as active ingredients in finely divided form about 3.5 to about 5 parts by weight of sodium phosphoalginate, about 1 to about 1.5 parts by weight of sodium carbonate, about 2 to about 3 parts by weight of calcium sulfate dihydrate, and an edible antifoaming agent in an amount sufficient to prevent undue foaming when said composition is employed in forming a cold milk pudding.

A method of forming a cold-milk pudding by blending either of the above compositions with a suitable amount of water to solubilize it, and thereafter blending the solubilized composition with a suitable quantity of cold milk.

3,770,463

FLAVOR ENHANCING COMPOSITION FOR FOODSTUFFS

Daniel Robert McSweeney, Lombard, and John Richard Kandl, Chicago, both of Ill., assignors to General Foods Corporation, White Plains, N.Y.

Filed Sept. 20, 1971, Ser. No. 182,216
Int. Cl. A23l *1/26*
U.S. Cl. 426—212 **5 Claims**

An edible composition consisting essentially of salt, hydrolyzed soy and corn proteins, beef flavor and onion flavor has been found to enhance the flavor of foodstuffs in a way similar to monosodium glutamate.

3,770,464

DRY REPLENISHMENT OF ELECTROLESS COPPER SOLUTIONS

Oleh B. Dutkewych, Medfield, and Lebert A. Hofman, Westboro, both of Mass., assignors to Shipley Company, Inc., Newton, Mass.

Filed Oct. 12, 1971, Ser. No. 188,243
Int. Cl. C23c *3/02*
U.S. Cl. 106—1 **13 Claims**

This invention is for replenishment of an aqueous electroless copper plating solution and to apparatus useful therefore. The process comprises addition of replenishers in essentially dry form in a manner that avoids triggering of the bath. Typical replenishers that may be added in dry form include one or more of a source of cupric ions such as cupric sulphate, a reducing agent for cupric ions such as paraformaldehyde, a chelating agent for cupric ions, bath stabilizers, brighteners, surfactants and the like. These ingredients may be added singularly or admixed with each other. Essentially dry materials are used for replenishment rather than a solution as in the prior art to prevent volume growth of the plating solution.

3,770,465

MOLD WASH COMPOSITION

Norman C. Howells, Conneaut, Ohio, assignor to Exomet, Incorporated, Conneaut, Ohio

Filed July 19, 1971, Ser. No. 164,030
Int. Cl. B28b *7/38*
U.S. Cl. 106—38.23 **5 Claims**

A mold wash consisting of a vehicle wherein there is held in suspension a mixture of a refractory base, a suspension agent, a binder and a readily volatilized constituent selected from the group consisting of metals and complex metal flourides. The wash is characterized in that the readily volatilized constituent reacts to form a refractory. A preferred constituent is potassium zirconium flouride.

3,770,466

HEAT-INSULATING SHAPED COMPOSITIONS

John Wilton, Calumet City, Ill., assignor to Foseco International Limited, Nechells, England

Continuation of Ser. No. 30,996, April 22, 1970, abandoned, which is a continuation-in-part of Ser. No. 656,920, July 28, 1967, abandoned. This application Jan. 24, 1972, Ser. No. 220,402
Int. Cl. C04b *35/52*
U.S. Cl. 106—56 **9 Claims**

Heat insulating compositions useful as slabs, riser sleeves, and the like are disclosed which consist essentially of a refractory fibrous material such as synthetic mineral wool, a binder, and a crushed coke or fly ash filler. The compositions can be used in the casting of copper based alloys or iron where the fibers themselves are not suitable.

3,770,467

REFRACTORY SUBSTANCE

Denzil Reginald Frank Spencer, Oldcotes, near Worksop, England, assignor to Steetley (Mfg.) Limited, Worksop, England

Filed Oct. 8, 1971, Ser. No. 187,906
Claims priority, application Great Britain, Oct. 9, 1970, 48,176/70
Int. Cl. C04b *35/04*
U.S. Cl. 106—58 **2 Claims**

A dead-burned refractory magnesia composition suitable for use in the manufacture of high hot strength magnesia refractories comprises at least 95% by weight MgO, less than 0.4% by weight of silica, an amount of lime greater than (2S + 0.3)% by weight, where S is the percentage by weight of silica, the weight ratio of lime to silica in the composition being greater than 3:1, and boron in an amount of less than 0.25% by weight expressed as B_2O_3.

3,770,468

PROCESS FOR TREATING PLASTER OF PARIS

Alfons Knauf, Siersburg; Peter Hartmann, Kitzingen/Main; Adolf Schmidt, and Franz Wirsching, both of Iphofen, all of Germany, assignors to Gebr. Knauf Westdeutsche Gipswerke, Iphofen/Mfr., Germany

Filed May 10, 1971, Ser. No. 141,939
Claims priority, application Germany, May 15, 1970, P 20 23 853.3
Int. Cl. C04b *11/00*
U.S. Cl. 106—110 **7 Claims**

A plaster of paris which can be quickly mixed with water to produce a uniform and malleable mortar is produced by spray-

ing powdered burnt plaster of paris with an aqueous solution of a wetting effect material, the amount of water being such that the plaster remains powdered but that the anhydrite III contained in the plaster of paris is converted to the hemihydrate.

3,770,469

PROCESS FOR PREPARING SELF-DISINTEGRATING PRODUCTS CONTAINING DICALCIUM SILICATE

Laszlo Kapolyi, Budapest; Ferenc Lazar, Tatabanya; Gyorgy Vamos, Tatabanya, and Bela Galauner, Tatabanya, all of Hungary, assignors to Tatabanyai Szenbanyak, Tatabanya, Hungary

Filed Apr. 1, 1971, Ser. No. 130,513

Claims priority, application Hungary, Apr. 6, 1970, TA-1055

Int. Cl. C04b *1/00*

U.S. Cl. 106—120 **5 Claims**

To the starting material containing at least 10 percent of SiO_2 and 25 percent of Al_2O_3, limestone and small quantities of metallic desoxidants are admixed, and having been clinkerized at a temperature of 1,250° to 1,420°C it is cooled abruptly with air and/or water to a temperature of about 700°C. The extracted product can be used for alumina production, the residue for cement production.

3,770,470

PIGMENTED RESIN COMPOSITIONS

Thomas F. Swank, Chelmsford, Mass., assignor to Cabot Corporation, Boston, Mass.

Continuation-in-part of Ser. No. 872,389, Oct. 29, 1969. This application Dec. 13, 1972, Ser. No. 314,509The portion of the term of this patent subsequent to Aug. 11, 1987, has been disclaimed.

Int. Cl. C09c *1/36*; C08b *27/02*; C09c *3/02*

U.S. Cl. 106—193 J **10 Claims**

This disclosure relates to the use of titanium dioxide coated with a boehmite-type alumina having an average crystallite size of at least about 50 angstroms as a pigment for thermoplastic resins.

3,770,471

STARCHING COMPOSITION

Mamoru Katsumi; Toshio Sato; Yasuo Yanagawa, and Tadao Hara, all of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Dec. 27, 1971, Ser. No. 212,642

Claims priority, application Japan, Dec. 30, 1970, 45/122268

Int. Cl. C08b *21/32*, *25/02*; C08f *45/24*

U.S. Cl. 106—197 C **9 Claims**

A starching composition containing, as a lubricant, from 0.5 to 5 percent by weight, based on the weight of the effective starching component, of at least one compound of a molecular weight in the range of 4,500 to 12,000 and selected from the group consisting of the ethylene oxide adducts of (a) fatty alcohols of 12 to 18 carbon atoms, (b) saturated fatty acids of 12 to 18 carbon atoms and (c) alkylphenols of 14 to 18 carbon atoms.

3,770,472

PROCESS FOR PREPARING MODIFIED STARCH DISPERSIONS

Wadym Jarowenko, Plainfield, N.J., assignor to National Starch and Chemical Corporation, New York, N.Y.

Filed May 9, 1972, Ser. No. 251,691

Int. Cl. C08b *27/22*

U.S. Cl. 106—213 **10 Claims**

A process for preparing dispersions of modified starches is disclosed comprising reacting starch in a dilute aqueous fine colloidal dispersion, at an alkaline pH, in the presence of a cationogenic reagent, with a polyfunctional reagent having groups capable of reacting with both the starch molecule and the cationogenic reagent, whereby the cationogenic reagent is chemically bound to the starch molecule. The resulting cationic starch is useful as a flocculant and pigment retention and strength additive in papermaking. The cationic starches prepared by the process of this invention may be used without isolation and purification as flocculants and pigment retention and strength additives in papermaking.

3,770,473

ENAMEL TO BE APPLIED ON NATURAL OR ARTIFICIAL TEETH

Louis Jules Lepere, rue Vanderschrick 65, Brussels, Belgium

Filed Mar. 25, 1970, Ser. No. 23,520

Claims priority, application Belgium, Mar. 26, 1969, 71886

Int. Cl. C08h *11/02*, *11/06*

U.S. Cl. 106—220 **2 Claims**

The enamel to be applied on natural or artificial teeth is obtained by dispersing a nontoxic pigment in an ethanolic solution containing one or several nontoxic film-forming emulsifying and plastifying substances.

3,770,474

PROCESS FOR PREPARING PHTHALOCYANINE BLUE PIGMENTS

Robert Langley, Newton Mearns; Ronald Francis John Richards, Paisley, and William Gill Warwick, Bridge of Weir, all of Scotland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Aug. 4, 1970, Ser. No. 60,952

Claims priority, application Great Britain, Aug. 13, 1969, 40,453/69

Int. Cl. C08h *17/14*

U.S. Cl. 106—288 Q **17 Claims**

Phthalocyanine blue pigments are prepared in pigmentary form by preparing a crude phthalocyanine in a high-boiling inert organic solvent, slurrying the mixture with concentrated sulphuric acid, drowning out into water or aqueous alkali and steam distilling off the solvent.

3,770,475

PROCESS FOR PRODUCING HYDRATES OF CALCIUM-MAGNESIUM SILICATES

Josef Wuhrer, Wulfrath; Heinz Georg Kurczyk, Monchengladbach, and Adrian Ottenheym, Wulfrath, all of Germany, assignors to Rheinische Kalksteinwerke GmbH, Wulfrath, Germany

Filed June 8, 1971, Ser. No. 151,139

Claims priority, application Germany, June 9, 1970, P 20 28 227.3; July 28, 1970, P 20 37 252.5

Int. Cl. C09c *1/02*

U.S. Cl. 106—306 **7 Claims**

Hydrates of calcium-magnesium silicates are produced by the hydrothermal reaction of the oxides or hydroxides of calcium and magnesium with silicic acid in the presence of water. The reaction product may be further treated with carbon dioxide.

3,770,476

PROCESS FOR THE PRODUCTION OF FLOCCULATION RESISTANT PIGMENTS

Robert Bruce McKay, Kilmarnock, Scotland, assignor to Ciba-Geigy AG, Basel, Switzerland

Continuation-in-part of Ser. No. 63,282, Aug. 12, 1970, abandoned. This application Feb. 9, 1972, Ser. No. 225,002
Claims priority, application Great Britain, Aug. 13, 1969, 40,454/69
Int. Cl. C09b
U.S. Cl. 106—309 14 Claims

Flocculation resistant pigments are prepared by milling together a phthalocyanine pigment, a chloromethylated phthalocyanine compound and organic amines.

3,770,477

HISTOLOGICAL SLIDE

Theodore E. Weichselbaum, Normandy, Mo., assignor to Sherwood Medical Industries, Inc., St. Louis, Mo.

Filed Mar. 16, 1972, Ser. No. 235,187
Int. Cl. G02b 21/34
U.S. Cl. 117—3 10 Claims

A microscope slide to be used for a histological specimen is provided with a transparent metallic fluoride coating, and a biological specimen adhering to the coating. The histological slide is prepared by providing a thin transparent coating of a metallic fluoride on one side of a glass slide, and a biological specimen is applied to the coated side to effect an adhesion between the coating and the specimen.

3,770,478

TRANSFER MEDIUM WITH A PIGMENTED COATING

John J. Bishop, Dayton, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

Filed Aug. 31, 1971, Ser. No. 176,737
Int. Cl. B41m 3/12; B32b 27/08
U.S. Cl. 117—3.4 5 Claims

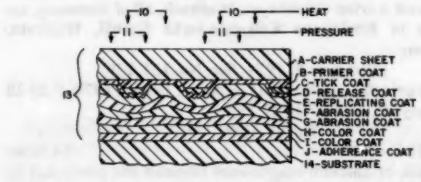
Pigmented coatings comprised of TiO_2 pigment in a binder of aminotriazine resin and polyester or a copolymer are disclosed. The coatings can be placed on a transfer base such as polyethylene terephthalate and transferred to credit card basis. Organic solvent based coatings also can be silk-screened directly onto the credit cards. Up to 50 weight percent of the TiO_2 pigment can be replaced with a pigment extender such as $CaCO_3$. The resulting credit cards are resistant to scratching and other surface damage. By the use of a dual binder system, the pigmented coating is easily transferred in one step and permanently heat sealed in a second step.

3,770,479

HOT STAMP TAPE WITH ETCHED CARRIER

Richard E. Dunning, Munster, Ind., assignor to Thermark Corporation, Schererville, Ind.

Continuation-in-part of Ser. No. 188,423, Oct. 12, 1971, Pat. No. 3,666,516. This application May 26, 1972, Ser. No. 257,433
Int. Cl. B41m 3/12; B44c 1/16
U.S. Cl. 117—3.4 7 Claims



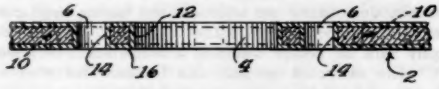
A web of indeterminate length carrying thermally transferable material, usually referred to as hot stamp tape, is structured to provide an improved simulated wood grain pattern on a substrate after transfer to the substrate of transferable portions of the tape. The web or tape may be provided in sheet form. A carrier sheet is etched to provide "ticks" or discrete linearly oriented spots of material having lower specular reflectivity than the remainder of the surface and a layer is coated thereon to provide the top layer of the transferred material, which replicates the surface of the carrier sheet. Either the tick areas or non-tick areas may be etched depending on the effect of the etchant and the characteristics of the unetched areas.

3,770,480

METHOD OF MAKING COATED GASKETS

Robert G. Farnam, New Lisbon, Wis., assignor to F. D. Farnam Co., Lyons, Ill.

Continuation-in-part of Ser. No. 40,112, May 25, 1970, Pat. No. 3,661,401. This application Aug. 5, 1971, Ser. No. 169,281
Int. Cl. B41k 3/68; B44d 1/02
U.S. Cl. 117—4 13 Claims



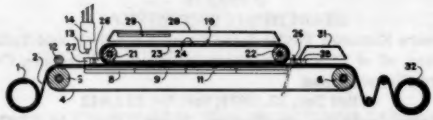
A method of manufacturing tailored gaskets and the article produced thereby wherein a suitable gasket material is provided with a coating applied in such a manner that there is little loss of coating material, and manufacturing costs are lowered. Ideally, the gaskets are formed from materials in the sheet, blank or web form using single or multiple die-cutting operations before and after the gasket material in various forms is coated with a fluid-impermeable coating.

3,770,481

PROCESS FOR THE PRODUCTION OF A LEATHER SUBSTITUTE

Christian Canat, La Batisse, Chalabre, France, assignor to Etablissements Hutchinson-Compagnie Nationale du Caoutchouc, Paris, France

Filed July 26, 1971, Ser. No. 166,113
Claims priority, application France, July 24, 1970, 7027428; Feb. 10, 1971, 7104393
Int. Cl. B44c 1/02
U.S. Cl. 117—10 3 Claims



Supple and resistant material especially suited to be used as a leather substitute is produced by process wherein a cross-linkable coating composition of a microporous product is spread on a water vapor-permeable sheet and the coated sheet is maintained in contact with a belt applicator moving at the same speed and in the same direction as the coated sheet, the time of contact being sufficient to maintain the composition of the coated sheet in compression for at least a part of the cross-linking period.

3,770,482

ELECTROSTATIC COATING METHOD OF APPLYING MULTILAYER COATING

John M. Millar, Joppa, and William F. Moran, Randallstown, both of Md., assignors to Beatrice Foods Co., Chicago, Ill.

Filed Jan. 18, 1971, Ser. No. 197,559
Int. Cl. B05b 5/02; B44d 1/095, 1/12, 1/14
U.S. Cl. 117—17 9 Claims

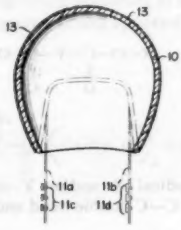
A process for electrostatically applying a multilayered coating on a substrate in one operation or step is disclosed, wherein a mixture of powders of at least two different coating materials is used as the coating composition, each powder, in the case of non-conducting powders, differing from the others in dielectric constant by a factor of at least 0.1, and the powders being of substantially different specific gravities, with the components having the lowest dielectric constant value having the lowest specific gravity value. At least one of the powders will be a powder of a film-forming non-conductive organic or inorganic polymer. Upon electrostatically applying a coating of this powdered composition to a conductive substrate which has a neutral charge or a charge opposite from that of the coating composition powder particles, the powders stratify into distinct layers of different compositions. The powders adhere to the substrate because of contact or static electrification for a reasonable length of time and until at least one of the powders can be cured or fused to form the final coating. Thus, for instance, in only one pass with an electrostatic spray gun, a protective coating of superimposed layers of zinc, epoxy, and polyethylene can be applied to a conductive substrate.

3,770,483

NOCTILUCENT REFLECTIVE HELMET

Shinsuke Komine, Tokyo, Japan, assignor to Kabushiki Kaisha Komine Auto Center, Tokyo, Japan

Continuation of Ser. No. 727,231, May 7, 1968, abandoned. This application July 8, 1971, Ser. No. 160,951
Claims priority, application Japan, Feb. 28, 1968, 43/15515
Int. Cl. A42b 3/00; B44d 1/16
U.S. Cl. 117—33 2 Claims



A helmet used for securing traffic safety for the pedestrians at night which is possessed of a noctilucent reflector affixed onto the outer surface thereof consisting of a reflective layer formed by mixing a highly reflective powdered metal and transparent granules, which make the helmet extremely easily recognizable from all the directions in the dark.

3,770,484

ELECTROPHOTOGRAPHIC COPYING, PRINTING OR REPRODUCING METHOD

Nicholas Gilbert Shreeve, "Conkers", Elgin Road, Weybridge, England

Filed June 28, 1971, Ser. No. 157,544
Int. Cl. G03g 13/08, 13/10
U.S. Cl. 117—37 LE 9 Claims

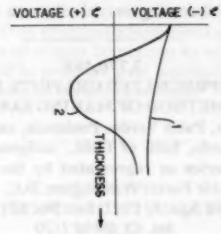
The invention relates to an electrostatic copying method by which non-conductive images on an original are reproduced. An image forming member is used of such resistivity and thickness that charge applied to one surface is retained thereon, but can be discharged through the thickness of the material when a discharge path is provided at the opposite surface. When such discharge path is provided and the image forming member is charged, the first surface thereof will be discharged in areas opposite the conductive path, but will retain its charge in other areas.

3,770,485

METHOD FOR LIQUID-DEVELOPING AN ELECTROSTATIC IMAGE

Kazuhiko Kasuya, Kanagawa; Wasaburo Ohta, and Zenjiro Okuno, both of Tokyo, all of Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan

Continuation-in-part of Ser. No. 772,242, Oct. 31, 1968, Pat. No. 3,640,751. This application Sept. 20, 1971, Ser. No. 182,176
Claims priority, application Japan, Nov. 6, 1967, 42/70991
Int. Cl. G03g 13/10, 9/04
U.S. Cl. 117—37 LE 7 Claims



An electrophotographic liquid-developing method comprising controlling the polarity of the toner by varying the temperature of the developer solution. An electrostatic charge-substrate having an electrostatically charged latent image is immersed in the developer solution to convert such latent image into a visible image. The developer solution comprises a toner consisting of pigment particles and at least one resin selected from the group consisting of alkyd resin, phenol resin and vinyl resin, and a carrier liquid in which said toner is dispersed. The carrier liquid comprises at least one dispersion medium having different affinities to said resin depending on the temperature.

3,770,486

MOISTURE VAPOR BARRIER COATING METHOD

Richard Konrad Hopermann, Oakland, N.J., assignor to The Borden Company, New York, N.Y.

Division of Ser. No. 691,942, Dec. 20, 1967, Pat. No. 3,671,294. This application Apr. 9, 1971, Ser. No. 132,833
Int. Cl. B44d 1/16
U.S. Cl. 117—38 7 Claims

This invention relates to a method of preparing a moisture resistant packaging material comprising a cellulosic base material having printed matter on one side of the packaging material and on the same side as the printed matter, a primer

coating composition and a top lacquer coating composition applied over the primer composition and wherein the printed matter, the primer coating composition and the top lacquer coating composition are applied to the base material using a gravure cylinder.

3,770,487

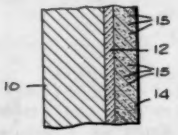
REFRACTORY COMPOSITES

James O. Gibson; Robert L. Schumacher, and Thomas W. Gore, all of Richland, Wash., assignors to McDonnell Douglas Corporation, Santa Monica, Calif.

Filed Jan. 28, 1971, Ser. No. 110,485

Int. Cl. C04b *35/52, 35/58*

U.S. Cl. 117—46 CA **27 Claims**



Production of oxidation resistant, thermal shock resistant and high strength composites, produced by hot pressing at high temperatures, e.g., about 2,100°C, a mixture preferably of a boride such as hafnium diboride, a silicide such as tungsten disilicide, and a minor portion of discrete carbon particles such as graphite, e.g., a mixture of 66 percent hafnium diboride, 20 percent tungsten disilicide and 14 percent graphite fibers, by weight, against a high temperature resistant substrate, e.g., a metal such as tantalum, to form an integral bonded composite coating on said substrate.

3,770,488

METAL IMPREGNATED GRAPHITE FIBERS AND METHOD OF MAKING SAME

Roger T. Pepper, Palos Verdes Peninsula, and Ernest G. Kendall, El Segundo, both of Calif., assignors to The United States of America as represented by the Secretary of the United States Air Force, Washington, D.C.

Filed Apr. 6, 1971, Ser. No. 131,823

Int. Cl. B44d *1/20*

U.S. Cl. 117—47 R **10 Claims**

A technique for effecting the impregnation of graphite yarn with a metal matrix by a process which includes enhancing the wettability of the graphite yarn by initially immersing the yarn in a metal infiltrate composed of either a molten tin-titanium alloy, a molten copper-tin-titanium alloy of molten sodium. After removal from the molten infiltrate, the yarn is then immersed into a molten bath of a metal impregnate composed of either aluminum, aluminum-base alloys, magnesium, or magnesium-base alloys. The metal impregnant leaches out the metal infiltrate from the graphite yarn. This permits the metal impregnant to fill up the interstices of the yarn and coat the graphite filaments of the yarn.

3,770,489

CREASEPROOFING CELLULOSE-BASED FABRICS

Byron L. Richardson, Aiken, S.C., assignor to United Merchants and Manufacturers', Inc., New York, N.Y.

Filed Sept. 16, 1971, Ser. No. 181,257

Int. Cl. D06m *15/52, 15/72*

U.S. Cl. 117—76 T **8 Claims**

A method for rendering cellulose-based fabrics wrinkle resistant by impregnating the fibers of the fabric with a polymer builder, polymerizing the polymer builder in the impregnated fabric while the fibers are in a wet and swollen state, drying the fabric, and then depositing a film of silicone polymer on the fabric. Fabrics obtained from the process are described.

3,770,490

METHOD OF MAKING AND COATING WITH HIGH SOLIDS CURED ACRYLIC SYRUPS

Earl E. Parker, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 5, 1971, Ser. No. 104,134

Int. Cl. B44d *1/50*

U.S. Cl. 117—93.31 **25 Claims**

A method of curing acrylic syrups comprises polymerizing a mixture of acrylic monomers, isopropyl alcohol, and peroxide catalyst by subjecting to heat and adding monofunctional acrylic monomers and poly-functional acrylic monomers to the polymerized acrylic composition to form an acrylic syrup and curing the acrylic syrup by subjecting to either ionizing irradiation or actinic light. The cured syrups are useful as interior or container coatings.

3,770,491

SYSTEM HARDENABLE BY IONIZING RADIATION

Herbert Spoor, Limburgerhof, and Kurt Demmler, Ludwigshafen, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhine, Germany

Filed Nov. 8, 1971, Ser. No. 196,776

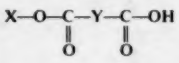
Int. Cl. B44d *1/50*

U.S. Cl. 117—93.31 **18 Claims**

A process for the production, on a substrate, of coatings with improved adhesion, mechanical properties and corrosion resistance wherein a mixture which contains, as the components forming the binder, a mixture of olefinically unsaturated organic compounds is first applied by a conventional method to the substrate to be coated and then cured with ionizing radiation and wherein the binder is a mixture of the following components:

A. from 50 to 98 percent by weight of at least one copolymerizable compound having a boiling point above 100°C and containing at least two olefinically unsaturated bonds:

B. from 50 to 2 percent by weight of compounds of the general formula:



in which the radical X and/or Y contains at least one copolymerizable C—C double bond and up to twenty carbon atoms; and

C. from 0 to 30 percent by weight of at least one other compound (not identical with the compounds specified under (B) having a single olefinic unsaturation; the sum of the percentages given under (A), (B) and (C) being 100.

3,770,492

METHOD OF MANUFACTURE OF MATERIALS FROM POLYCRYSTALLINE FILAMENTS

Hermann J. Schladitz, Bodenseestr. 3a, Munich, Germany

Continuation of Ser. No. 31,022, Aug. 22, 1970, abandoned. This application May 31, 1972, Ser. No. 258,298

Claims priority, application Germany, Apr. 25, 1969, P 19 21 211.4

Int. Cl. C23c *11/02*

U.S. Cl. 117—107.2 **2 Claims**

A process for the manufacture of high-strength materials from metallic polycrystalline filamentary material, e.g. iron, which has been deposited from the gaseous phase, wherein a mass of the filaments is consolidated by deposition of a metal thereon to join and bond the filaments at their points of inter-

section, whereafter the mass is briefly heated under pressure to produce a diffusion bond between the metal of the filaments and the metal deposited thereon and to compact the mass. Thereafter the mass may be impregnated with a metal of lower melting point. Loose unbonded masses of filaments may be similarly impregnated, particularly if the filaments are given a prior surface treatment to reduce oxidation and so ensure wetting of the filaments by the impregnating metal. Where the impregnating metal forms an alloy with the metal of the filaments, the latter may be provided with one or more intermediate layers of a non-alloying substance.

3,770,493

ARTICLE COATED WITH FLUORINATED POLYMER

Ronald E. Gilbert, Shawnee Mission, Kans., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation of Ser. No. 64,512, Aug. 17, 1970, Pat. No. 3,709,855. This application Feb. 28, 1972, Ser. No. 229,822

Int. Cl. B32b *15/08;* **C09d** *3/60*

U.S. Cl. 117—132 CF **1 Claim**

Coated articles are prepared in which a fibrous web, wood, or metal substrate is coated with a fluorohydrocarbon polymer prepared by fluorinating a hydrocarbon polymer containing trans unsaturation, prepared by deacetylation of an ethylene-vinyl acetate copolymer, with a lead oxide — hydrogen fluoride fluorinating agent.

3,770,494

MODIFIED ACRYLONITRILE POLYMER FIBERS

Yoshihisa Shichijo; Yasushi Ichikawa; Yoshiharu Sugaya, and Takeshi Ueda, all of Shizuokaken, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

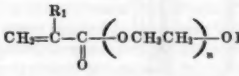
Filed Dec. 16, 1970, Ser. No. 98,891

Claims priority, application Japan, Dec. 18, 1969, 44/101285

Int. Cl. D06m *15/36;* **B32b** *27/30*

U.S. Cl. 117—138.8 UA **4 Claims**

Modified acrylonitrile polymer fibers having wash-resistant antistatic properties can be obtained by treating acrylonitrile polymer fibers containing at least 40 percent by weight of acrylonitrile with a copolymer consisting of 60 – 98 percent by weight of a vinyl compound having a general formula of



(wherein R_1 is hydrogen or methyl group, n is an integer of 3 to 50 and R_2 is alkyl group having one to 20 carbon atoms or alkylphenyl group having one to 20 carbon atoms in alkyl moiety) and 40 – 2 percent by weight of acrylonitrile.

3,770,495

NON-ADHESIVE HIGH ELASTIC ELASTOMER THREADS

Hans Lenz, Dormagen; Joachim Kolbe, Leverkusen; Herbert Marzolph, and Kurt Bernklau, both of Dormagen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

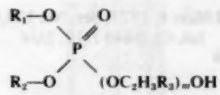
Continuation of Ser. No. 788,335, Dec. 31, 1968, abandoned. This application Oct. 28, 1971, Ser. No. 193,572

Claims priority, application Germany, Jan. 8, 1968, P 16 69 432.9

Int. Cl. D02g *3/36;* **B44d** *1/22*

U.S. Cl. 117—138.8 D **3 Claims**

Normally sticky segmented polyurethane threads are rendered non-adhesive by coating with a dressing agent comprising tertiary phosphoric acid ester of the formula



in which R_1 and R_2 are hydrocarbon radicals of the formula C_nH_{2n+1} or C_nH_{2n-1}; n is 1 to 20; m is an integer of from 1 to 6; and R_3 is hydrogen or methyl. The coating can optionally contain, as an additional ingredient, an ethylene oxide adduct of the formula

$$R - (O-CH_2-CH_2)_pOH$$

in which R is a hydrocarbon radical of the formula C_qH_{2q+1} or C_qH_{2q-1}; q is 10 to 20; and p is an integer of from 4 to 50.

3,770,496

ELIMINATION OF DIELECTRIC DEGRADATION IN PRINTED BOLD/DIELECTRIC/PALLADIUM-SILVER STRUCTURES

Oliver A. Short, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed June 25, 1971, Ser. No. 156,992

Int. Cl. H05k *1/02;* **B41m** *3/08*

U.S. Cl. 117—212 **6 Claims**

In a method for printing multilayer electronic structures on a substrate which minimizes degradation at crossovers in structures which comprise a gold electrode, dielectric crossovers, and a silver or silver/palladium electrode, in that order, the incorporation of at least 20 percent by weight silver in the metallization used to print the gold electrode. Also provided are objects prepared by the above method.

3,770,497

METHOD OF PRODUCING A TWO LAYER CONTACT PIECE

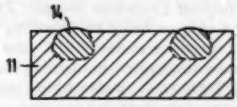
Heinrich Hassler, Wendelstein, and Horst Schreiner, Nurnberg, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Mar. 25, 1971, Ser. No. 128,060

Claims priority, application Germany, Mar. 26, 1970, P 20 14 638.7

Int. Cl. H01h *33/66*

U.S. Cl. 117—212 **6 Claims**

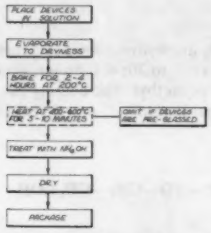


The invention relates to a method of producing a two layer contact piece for high vacuum power switches. An auxiliary metal and a diffusion metal are alloyed by diffusion into a surface of a metallic original body of high electrical conductivity. The auxiliary metal forms a molten phase with the diffusion metal and the metallic original body. The volume of auxiliary metal provides a defined diffusion depth in the original body, at predetermined diffusion conditions.

3,770,498
PASSIVATING SOLUTION AND METHOD

Dervin L. Flowers, Palos Verdes, Calif., assignor to Teledyne Semiconductor, a division of Teledyne, Inc., Mountain View, Calif.

Filed Mar. 1, 1971, Ser. No. 120,020
Int. Cl. B44d 1/18, 1/14
U.S. Cl. 117—219 11 Claims

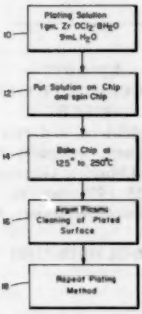


A solution and method for conditioning, gettering and sealing a semiconductor device. Oxides forming a synergistic combination are dissolved in a solvent which is constituted to wet the surface of a semiconductor device. The solution is applied, dried and baked to condition, getter, seal and otherwise passivate the device surface.

3,770,499
LIQUID PHASE DEPOSITION OF THIN INSULATING AND REFRACTORY FILM ON A SUBSTRATE

William J. Crowe; Kim Ritchie, both of Phoenix, and Harold S. Gurev, Scottsdale, all of Ariz., assignors to Motorola, Inc., Franklin Park, Ill.

Continuation-in-part of Ser. No. 99,969, Dec. 21, 1970, abandoned. This application Feb. 28, 1972, Ser. No. 230,071
Int. Cl. B44d 1/02, 1/20
U.S. Cl. 117—221 13 Claims


Plating Solution 1gm. Zr OCl2·8H2O 9mL H2O
Put Solution on Chip and spin Chip
Bake Chip at 125° to 250°C
Argon Plasma Cleaning of Plated Surface
Repeat Plating Method

It is known to deposit zirconium dioxide, ZrO_2, on a substrate comprising a chip or wafer by providing zirconium oxychloride, $ZrOCl_2$, vapor at about 550° C, the chip or wafer being at 450° C, in an atmosphere containing water vapor. Zirconium dioxide, ZrO_2, and hydrochloric acid, HCl, are produced and a layer of the ZrO_2 is deposited on the chip. The ZrO_2 layer acts as a passivation material having high resistivity and very good impermeability to sodium which can be destructive of the circuit on the chip or wafer. According to this invention, the ZrO_2 may be deposited on a substrate at a lower temperature from a liquid solution of the zirconium oxychloride, whereby the substrate may be paper or plastic and whereby the substrate if it includes a circuit will not be injured by the temperature needed by the prior art ..igh temperature treatment, and therefore the possible injury to the substrate or to the circuit therein by the prior art high temperature treatment is avoided.

3,770,500
MAGNETIC MATERIALS AND METHOD OF MAKING SAME

Yasuo Imaoka; Takeo Tada; Takashi Ishikawa, and Tatsuo Uehori, all of Tokyo, Japan, assignors to TDK Electronics Company Ltd., Tokyo, Japan

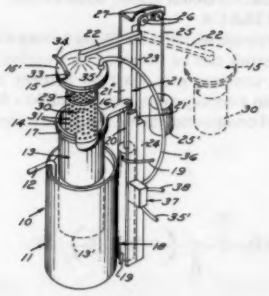
Filed Aug. 26, 1970, Ser. No. 67,273
Claims priority, application Japan, Sept. 16, 1969, 44/73388; Oct. 29, 1969, 44/86222; Sept. 25, 1969, 44/76468; Oct. 31, 1969, 44/87916
Int. Cl. H01f 10/00
U.S. Cl. 117—237 7 Claims

This invention relates to a magnetic material having particle cores of arbitrary configuration, the surface of which is coated with a layer of a ferromagnetic metal or alloy such as of Co or Ni or the like, having high coercive force and high magnetic flux density. When the particle cores are spicular, the spicular shape is maintained after the deposition of the ferromagnetic metals. The properties of the ferromagnetic material thus obtained are improved by heat treatment and are excellently usable as a magnetic recording medium and permanent magnets. The method of preparing the material comprises dispersing the particles in a solution containing metallic ions, heating the solution in a H_2 atmosphere at high pressures and heat-treating the resultant precipitate.

3,770,501
METHOD AND APPARATUS FOR REMOVING COATINGS FROM METALS

Eugene L. Kemper, Mt. Clemens, Mich., assignor to Upton Industries, Inc., Roseville, Mich.

Filed Dec. 23, 1971, Ser. No. 211,580
Int. Cl. C23g 1/28; B08b 7/00
U.S. Cl. 134—19 26 Claims



Thermochemical procedure and equipment for the substantially airless stripping of organic base coatings from objects by volatilization of the coating material as immersed in a molten salt bath. The procedure is carried out in a shroud-like object-receiving retort. This retort, when immersed at least in part at an open bottom thereof penetrating in said bath, is substantially sealed hermetically against entry of external atmospheric air to its interior. The bath is heated in a conventional pot by conventional immersion heating means; and the interior of the retort is conditioned during immersion, as by being placed and held under partial vacuum or by introducing an inert gas, to greatly reduce air content in the space therein above the bath, thus creating a nonoxidizing atmosphere. The retort is shown as being by preference sealed at its top by a removable gas tight cover. Volatilization continues for a relatively very brief time period, the resulting vapor product and possible gas arising to the conditioned retort space above the bath level. During this volatilizing period, or directly before and thereafter and with the retort still sealed and bottom-immersed in the bath, its interior above the salt level is evacu-

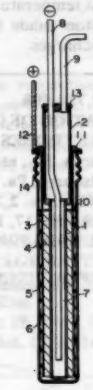
ated, as by a vacuum pump. The volatilization vapor, minimal product of combustion, smoke and the like are piped in a closed system to conventional incinerator, filter and/or scrubber means prior to discharge to atmosphere. The retort is then unsealed and placed in position for rinsing and removal of the stripped object or objects therefrom.

3,770,502

SODIUM-SULFUR STORAGE BATTERY

Takashi Nakabayashi, Takatsuki, Japan, assignor to Yuasa Battery Company Limited, Takatsuki, Japan

Filed Aug. 11, 1972, Ser. No. 279,813
Int. Cl. H01m 35/00
U.S. Cl. 136—6 FS 4 Claims



A sodium-sulfur storage battery made up of a solid electrolyte on which graphite sheet containing sulfur as a cathodic reactant is wound and is further tightly bound by sulfur-resistant metal, a reservoir connected to the solid electrolyte and sealed at its top, a battery container sealed by the battery cap attached to the reservoir and provided with a mechanism that absorbs stress applied to the upper part of the solid electrolyte, a negative terminal serving as a sodium injecting tube, and a positive terminal attached to the battery container. This sodium-sulfur storage battery has an improved performance and long life.

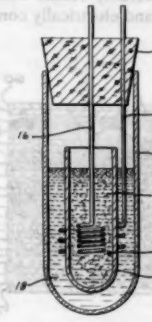
3,770,503

TWO COMPARTMENTED ELECTROCHEMICAL CELL HAVING ALUMINUM ANODE BUD POWDERED CARBON SUSPENDED IN THE CATHODE COMPARTMENT

George Dana Brabson, Jr.; Lowell A. King; David W. Seegmiller, and Armand A. Fannin, Jr., all of USAF Academy, Colo., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 6, 1972, Ser. No. 231,818
Int. Cl. H01m 21/14
U.S. Cl. 136—6 LF 3 Claims

A two compartmented electrochemical cell having an aluminum electrode in one compartment, an inert electrode in the other compartment, an aluminum chloride-sodium chloride electrolyte disposed in both compartments, and powdered carbon suspended only in that portion of the electrolyte disposed adjacent to the inert electrode.

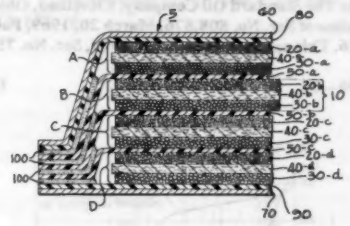


3,770,504

HIGH DISCHARGE RATE MULTICELL BATTERY

Bernard C. Bergum, Monona, Wis., assignor to ESB Incorporated, Philadelphia, Pa.

Filed Dec. 21, 1970, Ser. No. 100,236
Int. Cl. H01m 21/00
U.S. Cl. 136—10 13 Claims



A thin, flat, multicell battery comprising a multiplicity of electrically conductive layers arranged in cooperative electrical association with one another to provide a plurality of cells. The layers include intercell connectors which cooperate together to form sealed enclosures for each cell, and to form electrical connections to connect the cells in series. The battery has a minimized internal resistance, a capability for high discharge rates particularly suitable for the production of pulses of current, and a discharge efficiency far superior to conventional flat cell batteries at current densities exceeding 100 milliamperes per square inch of anode. These features are achieved by the adherence and electrical bonding one to the other of the confronting faces of the several conducting layers of the battery. The preferred form of the battery is discussed in terms of the LeClanche system.

3,770,505

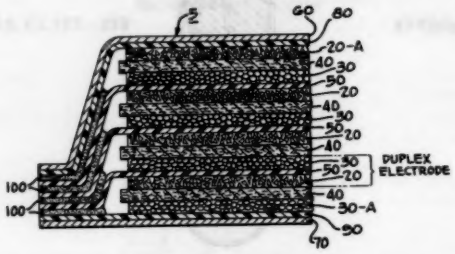
MULTICELL BATTERY COMPRISING DUPLEX ELECTRODE UTILIZING CONDUCTIVE PLASTIC CARRIER STRIP

Bernard C. Bergum, Monona; John M. Bilhorn, Edgerton; Kenneth H. Kenyon, Madison; William R. Macaulay, Madison, and John A. Youngquist, Madison, all of Wis., assignors to ESB Incorporated, Philadelphia, Pa.

Division of Ser. No. 100,257, Dec. 21, 1970, Pat. No. 3,694,266. This application Feb. 25, 1972, Ser. No. 229,597
Int. Cl. H01m 39/06
U.S. Cl. 136—10 2 Claims

Duplex electrodes are constructed by placing intermittent deposits of positive and negative electrodes on opposite sides

of a continuous, electrically conductive plastic carrier strip. The duplex electrodes are then assembled into multicell batteries. The assembly preferably occurs while the duplex electrodes are structurally and electrically connected by the continuous plastic carrier strip after which the carrier strip is subsequently cut between duplex electrodes to obtain structurally and electrically unconnected batteries. Alternatively, the carrier strip may be cut between duplex electrodes before those electrodes are assembled into multicell batteries.



3,770,506

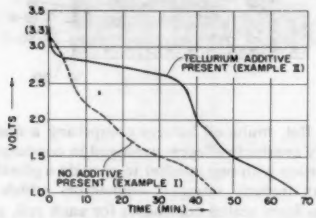
ELECTRICAL ENERGY STORAGE DEVICE CONTAINING A TELLURIUM ADDITIVE

Robert A. Rightmire, Northfield; Joseph E. Metcalfe, III, and James L. Benak, both of Bedford Heights, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation of Ser. No. 808,876, March 20, 1969, Pat. No. 3,567,516. This application Sept. 28, 1970, Ser. No. 75,893

Int. Cl. H01m *35/02*

U.S. Cl. 136—20 **1 Claim**



The capacity of an electrical energy storage device containing a high surface area carbon cathode, a metallic anode, and a fused salt electrolyte in contact with the electrodes, can be greatly enhanced by the addition of a tellurium compound directly to the electrolyte or to the carbon cathode. On passage of an electric current through the system, the tellurium becomes permanently bonded to the carbon of the cathode thereby forming an "active" tellurium species that manifests itself as a characteristic plateau in the discharge profile of the cell.

3,770,507

ELECTROCHEMICAL BATTERY EMPLOYING BONDED LEAD DIOXIDE ELECTRODE AND FLUOROBORIC ACID ELECTROLYTE

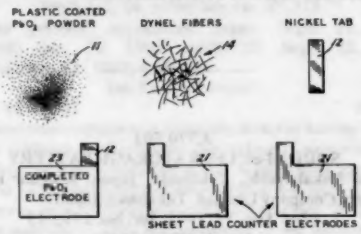
Eugene Yehuda Weissman, Glendale; Guy Douglas McDonald, Shorewood, and Conrad Eugene Weinlein, Milwaukee, all of Wis., assignors to Globe-Union Inc., Milwaukee, Wis.

Filed Jan. 24, 1972, Ser. No. 220,241

Int. Cl. H01m *39/00, 17/00*

U.S. Cl. 136—26 **11 Claims**

A lead dioxide electrode structure for an electrochemical battery employing fluoroboric acid as an electrolyte is formed from lead dioxide particles, a bonding material and preferably a synthetic fibrous material. The bonding and fibrous materials are mixed with the lead dioxide particles to form a compact and homogeneous electrode structure. The bonding and fibrous materials are partially resistant to the fluoroboric acid and are compatible with each other. The battery formed from the electrode structure is operable at temperatures as low as minus 60° centigrade and at temperatures as high as plus 100° centigrade and can be custom made to provide a variety of steady or pulsed current discharges.



3,770,508

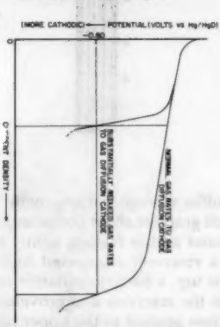
CATHODIC ACTIVATION OF GAS DIFFUSION ELECTRODES

Yehuda L. Sandler, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 2,285, Jan. 12, 1970, abandoned. This application Sept. 17, 1971, Ser. No. 181,591

Int. Cl. H01m *29/04*

U.S. Cl. 136—86 A **6 Claims**



A method of activating a gas diffusion electrode and operating a metal-gas cell containing an anode, a gas diffusion cathode having a gas fed into one side, and an electrolyte between the electrodes and permeating the other opposite side of the cathode, with a current flowing through a load circuit connecting the anode and cathode; by reducing the rate of gas flow to the gas diffusion cathode, at least once for at least about two minutes, to less than 5 cm^3/min for each cm^2 of exposed gas diffusion electrode area, so as to make the potential of the gas diffusion cathode more cathodic.

3,770,509

DUPLEX GAS DIFFUSION ELECTRODES WITH GAS DIFFUSION MEANS

August Winsel; Stempel Guenter; Gruene Horst, and Kurt Weidinger, all of Kelkheim/Taunus, Germany, assignors to Varta Aktiengesellschaft, Frankfurt/Main, Germany

Filed Nov. 22, 1967, Ser. No. 685,165

Claims priority, application Germany, Nov. 24, 1966, V 32412

Int. Cl. H01m *13/06*

U.S. Cl. 136—120 FC **3 Claims**

A multilayered gas diffusion unitary electrode body for an electrochemical apparatus, fuel cell elements and electrolysis

cell, said gas diffusion electrode having two catalytically active layers and comprising two electrode parts, each part having at least two layers, said parts being bonded to each other into a unitary construction by a bonding or connecting middle

layer which joins the respective larger pore layers of the respective electrode parts, said bonding layer comprising a resin or resin coated metal foil or web. A fuel cell battery comprising such multilayered electrodes. A method for bonding the electrode to give the structure described.

3,770,510

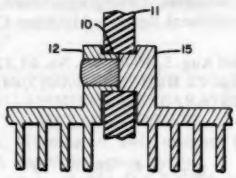
MAKING ELECTRICAL CONNECTIONS THROUGH A STORAGE BATTERY WALL

Anthony Sabatino, Minneapolis, Minn., assignor to Gould Inc., Mendota Heights, Minn.

Filed Sept. 18, 1967, Ser. No. 668,395

Int. Cl. H01m *5/00*

U.S. Cl. 136—134 R **3 Claims**



Two connector members, one on each side of the battery wall, are brought close to one another through an opening in the wall. The parts are then joined together by fusion and after fusing, pressure is applied to force the members to press firmly and securely against the respective sides of the wall to produce a tight seal against leakage of fluid through the opening in the wall.

3,770,511

STORAGE BATTERY HAVING INTEGRAL CABLES EXTENDING THE BATTERY'S TERMINALS

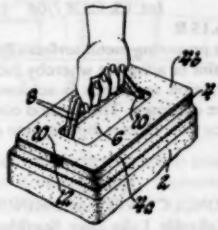
David A. Winterbottom; Ellis G. Wheadon, both of Anderson, and Philip E. Higdon, Munci, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 25, 1972, Ser. No. 247,352

Int. Cl. H01m *5/00*

U.S. Cl. 136—135 S **3 Claims**

A storage battery including attached terminal cables having sleeve connectors on their distal ends. When not in use, the cables lie in a hollow in the battery's cover. When the distal ends of the cables are appropriately fixed to the cover, the ca-



bles function as a carrying handle. After installation in a vehicle, the distal ends are released and free to move in any direction as the situation requires.

3,770,512

METHOD FOR SURFACE HARDENING STEEL AND CEMENTED CARBIDES

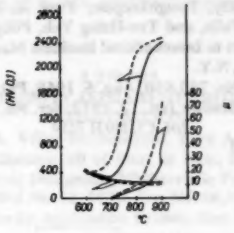
Anton Bopp, Dorfstrasse 198, Meilen, Switzerland

Filed July 26, 1971, Ser. No. 165,948

Claims priority, application Switzerland, July 28, 1970, 11484/70

Int. Cl. C23f *15/00, 7/04*; **C23c** *9/04*

U.S. Cl. 148—6 **21 Claims**



A method of surface hardening steel and cemented carbides, wherein the material to be treated is at a temperature exceeding approximately 570° C and while extensively excluding oxygen is brought into contact with a mixture containing approximately 5 – 70 parts by weight borium carbide, 1 – 60 parts by weight anhydrous aluminum oxide, trace amounts up to 6 parts by weight $NaBF_4$, and trace amounts up to 10 parts by weight sodium fluoride.

3,770,513

CHEMICAL TREATMENT OF METAL

Vernon Paul Wystrach, Wilton, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed June 8, 1972, Ser. No. 260,953

Int. Cl. C23f *7/08*

U.S. Cl. 148—6.15 R **10 Claims**

A method for preparing metal surfaces for receipt of a coating such as a paint or adhesive whereby increased coating adhesion and corrosion resistance is achieved and the treated metal per se, are disclosed. The method comprises contacting the metal surface with various phosphine oxides.

3,770,514

CHEMICAL TREATMENT OF METAL

Vernon Paul Wystrach, Wilton, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed June 8, 1972, Ser. No. 260,954
Int. Cl. C23f 7/08
U.S. Cl. 148—6.15 R 10 Claims

A method for preparing metal surfaces for receipt of a coating such as a paint or adhesive whereby increased coating adhesion and corrosion resistance is achieved and the treated metal per se, are disclosed. The method comprises contacting the metal surface with various diphosphine oxides.

3,770,515

HIGH CONDUCTIVITY ALUMINUM ALLOYS

Fred A. Besel, Lakeside, Lake Zoar, Southbury, Conn.

Continuation of Ser. No. 885,315, Dec. 15, 1969, abandoned, which is a continuation-in-part of Ser. No. 715,552, March 25, 1968, abandoned. This application May 15, 1972, Ser. No. 253,335
Int. Cl. C22f 1/04
U.S. Cl. 148—11.5 A 7 Claims

A process for obtaining a high conductivity material comprising the providing of a material from the group consisting of commercial purity aluminum and aluminum alloys wherein the alloy contains at least one alloying element in an amount of from 0.1 to 1.5 percent weight, the total not exceeding 3.0 weight percent, cold deforming the material at least 15 percent below 500°F, heating for at least 20 minutes in the range of 400° to 800°F and cooling.

3,770,516

MONOLITHIC INTEGRATED CIRCUITS

Michael C. Duffy, Poughkeepsie; Paul A. Schumann, Jr., Wappingers Falls, and Tsu-Hsing Yeh, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 750,650, Aug. 6, 1968, Pat. No. 3,655,457. This application Jan. 12, 1972, Ser. No. 217,407
Int. Cl. H01l 7/54
U.S. Cl. 148—33 6 Claims

FORM SEMICONDUCTOR WAFER OF P-TYPE CONDUCTIVITY
ION IMPLANT SUBCOLLECTOR REGIONS OF N+ TYPE CONDUCTIVITY MAKING N-TYPE CONDUCTIVITY FROM SUBCOLLECTOR TO WAFER SURFACE
ION IMPLANT P REGIONS FOR DIODE & FOR BASE REGION OF TRANSISTORS, STEPPING TO OBTAIN UNIFORM CONCENTRATION
ION IMPLANT N TYPE REGIONS FOR EMITTER AREA OF TRANSISTORS, STEPPING TO OBTAIN UNIFORM IMPURITY CONCENTRATION
ION IMPLANT COLD IMPURITY INTO THE COLLECTOR REGION OF THE TRANSISTORS & N REGION OF THE DIODE
ION IMPLANT P TYPE IMPURITY TO FORM UNDERPASS CONNECTOR BETWEEN TRANSISTOR BASE REGIONS
ION IMPLANT ELECTRICALLY NEUTRAL IONS INTO THE BASE REGION FOR A PNP TRANSISTOR
ION IMPLANT N REGIONS FOR PNP TRANSISTOR BASE, RESISTOR CONTACT AREAS, & DIODE N REGIONS
ION IMPLANT P+ REGION FOR CAPACITOR & EMITTER REGION OF THE PNP TRANSISTOR
ION IMPLANT N TYPE UNDER-PASS CONNECTOR BETWEEN DIODE N REGIONS
ION IMPLANT N TYPE RESISTOR REGION & TRIM RESISTANCE VALUE.

Monolithic integrated circuits are made utilizing various ion implantation techniques for making diodes, transistors, resistors, capacitors, underpass connections, sub-collector junctions, etc., and for altering impurity profiles, gold doping, trimming resistance values, altering junctions depth, and isolating regions.

3,770,517

METHOD OF PRODUCING SUBSTANTIALLY NON-ORIENTED SILICON STEEL STRIP BY THREE-STAGE COLD ROLLING

Thomas H. Gray, Pittsburgh, and Jack P. Martin, Lower Burrell, both of Pa., assignors to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 68,790, Sept. 1, 1970, abandoned. This application Mar. 6, 1972, Ser. No. 232,212
Int. Cl. H01f 1/04
U.S. Cl. 148—111 5 Claims

Described is a method of producing substantially non-oriented silicon steel by a three-stage cold rolling process wherein the silicon steel is temper rolled in the third or last rolling stage after normalizing to effect a reduction in gauge of about 2 to 12 percent, followed by annealing at a temperature no greater than 1,700° F for a time no longer than about 5 minutes.

3,770,518

METHOD OF MAKING GALLIUM ARSENIDE SEMICONDUCTIVE DEVICES

Ferenc E. Rosztoczy, Santa Clara; Celestin J. Casau, San Mateo County, and Joshyo Kinoshita, Santa Clara County, all of Calif., assignors to Varian Associates, Palo Alto, Calif.

Filed Jan. 28, 1971, Ser. No. 110,571
Int. Cl. H01l 7/38
U.S. Cl. 148—171 3 Claims

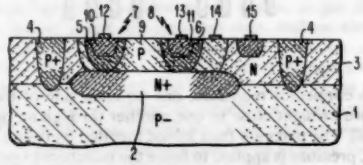
Germanium is disclosed as a p-type dopant useful in gallium arsenide semiconductive devices such as varactors, IMPATT diodes, photocathodes, and the like. p-n junction gallium arsenide devices are fabricated by successively sliding a germanium doped melt of gallium arsenide in gallium and an n-doped melt of gallium arsenide in gallium over a gallium arsenide seed crystal for growing successive epitaxial p and n or n and p layers on the substrate while exposing the substrate to only one thermal cycle, whereby improved p-n junction devices are obtained.

3,770,519

ISOLATION DIFFUSION METHOD FOR MAKING REDUCED BETA TRANSISTOR OR DIODES

Siegfried K. Wiedmann, Untergruppenbach, Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 5, 1970, Ser. No. 61,128
Int. Cl. H01l 7/36, 19/00, 7/44
U.S. Cl. 148—175 1 Claim



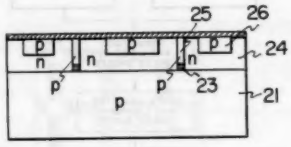
A method for making reduced beta transistors within one of a plurality of isolated regions of a microcircuit structure. The beta reduction is accomplished by using standard isolation diffusion technology modified only to the extent of opening a hole in the isolation diffusion mask at the base location of each desired reduced beta transistor having a subcollector. The isolation impurity, being of the same conductivity type as the base diffusion and being of relatively high impurity concentration, reduces the emitter efficiency of each desired reduced beta transistor to an extent whereby the reduced beta transistor functions substantially as a self-isolated diode. Self-isolation of the diodes is achieved utilizing a minimum of microcircuit device surface area by elimination of separate isolating regions for the resulting diodes.

3,770,520

PRODUCTION OF SEMICONDUCTOR INTEGRATED-CIRCUIT DEVICES

Yoshihiko Kabaya, and Heishichi Ikeda, both of Kanagawa-ken, Japan, assignors to Kabushiki Kaisha Kyodo Denshi Gijutsu Kenkyusho, Sagamihara-shi, Kanagawa-ken, Japan

Filed June 23, 1969, Ser. No. 835,356
Claims priority, application Japan, June 26, 1968, 43/44299
Int. Cl. H01l 7/36, 11/00; C23c 13/00
U.S. Cl. 148—175 2 Claims



A semiconductor integrated-circuit device in which, on a semiconductor substrate of a first conductivity type, a number of semiconductor regions of a conductivity type different from the first conductivity type are disposed and are surrounded around their side surfaces by polycrystalline layers within which is diffused an impurity imparting a conductivity different from that of the semiconductor regions, whereby the difference in diffusion velocities of impurities in single crystals and in polycrystalline structures is utilized

3,770,521

METHOD FOR DIFFUSING B OR P INTO S: SUBSTRATES

Herbert M. Demsky, Wappingers Falls; Wilbur H. Dexter, Hyde Park; Reginald F. Lever, Putnam Valley, and Paul A. Melzer, Newburgh, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 14, 1971, Ser. No. 134,009
Int. Cl. H01l 7/44
U.S. Cl. 148—189 2 Claims

A method is disclosed whereby a semiconductor silicon substrate wafer is diffused with a P or N type dopant or "impurity" in an open tube at a temperature of about 1050°C in the presence of at least a 50:1 ratio of water to dopant whereby the surface concentration of impurity is controlled below the solid solubility of the dopant in silicon.

3,770,522

EMULSION TYPE EXPLOSIVE COMPOSITION CONTAINING AMMONIUM STEARATE OR ALKALI METAL STEARATE

Ernst A. Tomic, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Continuation-in-part of Ser. No. 64,791, Aug. 8, 1970, abandoned. This application Apr. 13, 1972, Ser. No. 243,822
Int. Cl. C06b 1/04
U.S. Cl. 149—2 25 Claims

An emulsion type explosive composition containing inorganic oxidizing salt, e.g., ammonium nitrate, water, water-insoluble carbonaceous fuel, e.g., fuel oil, sensitizer, e.g., gas bubbles, and a selected stearate salt emulsifier, e.g., sodium stearate.

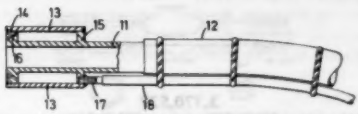
3,770,523

METHOD FOR THE PREPARATION OF THICKENED SLURRY EXPLOSIVES

Dilip Kumar Biswas, Bihar, India, assignor to Imperial Chemical Industries Limited, London, England

Filed June 16, 1971, Ser. No. 153,777
Claims priority, application Great Britain, June 19, 1970, 29,901/70
Int. Cl. C06c 3/10; C06d 1/08
U.S. Cl. 149—14 6 Claims

Improved method for the preparation of thickened slurry explosives wherein a cross-linking agent is fed to the surface of a stream of thickened aqueous slurry explosive to cross-link the thickening agent on the outer layer of the stream. The invention also includes a nozzle adapted to feed a liquid cross-linking agent to a stream of slurry explosive as it emerges through the nozzle discharge port.



3,770,524

COMPOSITE PROPELLANTS CONTAINING POLYMERS OF TRINITRATOPENTAERYTHRITYL ACRYLATE

Robert W. Walker, and Paul H. Gehlhaus, both of Huntsville, Ala., assignors to Rohm & Haas Company, Philadelphia, Pa.

Filed Oct. 22, 1958, Ser. No. 769,974
Int. Cl. C06d 5/06
U.S. Cl. 149—19.5 9 Claims

Polymerizable combustible compositions, suitable for the manufacture of propellants, consisting essentially of a mixture of (1) 14 to 31 parts of trinitratopentaerythrityl acrylate, (2) 1 to 3 parts of a polymerizable monoacrylic alkyl ester having an alkyl group of four to twelve carbon atoms, (3) 10 to 26 parts of a plasticizer for poly(trinitratopentaerythrityl acrylate), said plasticizer consisting essentially of a major proportion of compounds containing nitro groups, (4) 0.1 to 2.5 parts of a soluble multiply olefinically unsaturated polyester, (5) 30 to 65 parts of a solid powdered oxidizer and (6) 0 to 25 parts of a finely particled, readily combustible solid selected from the group consisting of carbon, aluminum, magnesium, zinc, zirconium and boron.

3,770,525

HIGH LUMINOSITY INFRARED PYROTECHNICAL COMPOSITION

Frank Pierre A. Villey-Desmeserets; Yves A. Pouliguen, and Germain Guillauma, all of Pont de Buis, France, assignors to Etat Francais Delegation Ministerielle Pour L'Armement

Filed Nov. 2, 1970, Ser. No. 86,193
Claims priority, application France, Nov. 5, 1969, 6938022
Int. Cl. C06d 1/10
U.S. Cl. 149—19 8 Claims

A high-luminosity pyrotechnical composition comprising, in finely divided state, an illuminant substance of high emissivity in the infrared band, at least one halogenated resin with fluorine atoms constituting at least two-thirds of the total number of halogen atoms and a metal which is highly reductive with the halogen atoms of the resin. The composition is in the form of an agglomerate mixture with the amount of reducing metal being between that stoichiometrically required for the reduction of the halogen atoms and an excess of 20 percent in relation to the stoichiometrical determination. The composition may optionally include a binder and it is press molded to shape the composition as a body. The composition may also contain barium stearate to regulate emission time.

3,770,526

COMBUSTION COMPOSITION CONTAINING A FERROCENYL OR CARBORAMYL DERIVATIVE

David C. Sayles, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 26, 1971, Ser. No. 202,694
Int. Cl. C06b 15/00
U.S. Cl. 149—22 4 Claims

A combustion composition comprising a member selected from the group consisting of ferrocene, carborane, ferrocenyl

and carboranyl derivatives; activated carbon; ammonium perchlorate; and aluminum powder. In operation, pellets or granules of the mixture are coated with calcium phosphate and applied to a combustible substrate.

3,770,527

NITRANIUM PERCHLORATE REACTION RATE ALTERATION

John Norman Maycock, Baltimore, Md., and Louis Witten, Cincinnati, Ohio, assignors to Martin Marietta Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 589,185, Oct. 19, 1966. This application Nov. 20, 1969, Ser. No. 878,591
Int. Cl. C06b *11/00*
U.S. Cl. 149—74 **10 Claims**

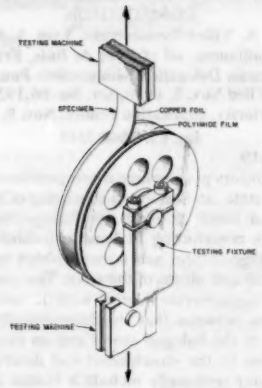
The rate of thermal decomposition of certain high energy solid state materials, such as nitronium oxidizers, may be either increased or decreased by doping to replace ions in the structure with ions having a different valence. Decompsoition rate is increased if univalent anions are replaced with multivalent anions, and rate is conversely decreased if univalent cations are replaced with multivalent cations that are less colored than the host material.

3,770,528

METHOD FOR THE SURFACE TREATMENT OF POLYIMIDE MATERIALS

Julius Hermes, Martinsville, Va., assignor to Martin Processing Company, Incorporated, Martinsville, Va.

Filed Sept. 29, 1971, Ser. No. 184,801
Int. Cl. B44d *1/092*
U.S. Cl. 156—2 **7 Claims**



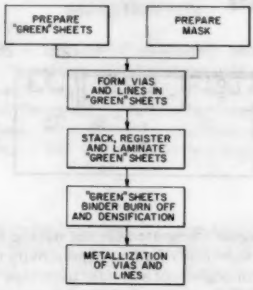
Polyimide materials are treated in such fashion as to impart to the treated surface thereof good bondability toward other materials, such as thin films of copper foil, to provide composite laminated articles useful in the industrial arts such as for printed circuitry and the like. The treatment consists essentially in subjecting the surface of the polyimide material to a solution, preferably anhydrous, of an alkali metal hydroxide in a high boiling glycol or glycol ether such as ethylene glycol, propylene glycol, dipropylene glycol, diethylene glycol, tetraethylene glycol, and the mono-ethers and di-ethers of such glycols.

3,770,529

METHOD OF FABRICATING MULTILAYER CIRCUITS

Leslie C. Anderson, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 25, 1970, Ser. No. 66,776
Int. Cl. B23k *27/00*
U.S. Cl. 156—3 **5 Claims**


PREPARE "GREEN" SHEETS
PREPARE MASK
FORM VIAS AND LINES IN "GREEN" SHEETS
STACK, REGISTER AND LAMINATE "GREEN" SHEETS
"GREEN" SHEETS BINDER BURN OFF AND DENSIFICATION
METALLIZATION OF VIAS AND LINES

Multiple level ceramic circuit structures are formed after the individual ceramic "green" sheets are machined using beams of radiation. Vias and channels are formed simultaneously in the individual "green" sheets by exposure of the sheet through a mask having apertures with predetermined dimensions. The method of fabricating the vias and channels recognizes the relationship between the size of the mask aperture and the depth of the machining in the "green" sheet by the beam of radiation. After stacking, registering and laminating the "green" sheets, they are sintered to a unitized state and only then metallized.

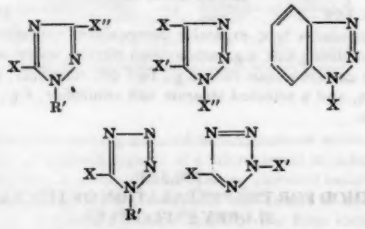
3,770,530

METHOD OF ETCHING COPPER AND ALLOYS THEREOF

Osamu Fujimoto, Fuji, Japan, assignor to Tokai Denka Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 24, 1971, Ser. No. 183,618
Claims priority, application Japan, Apr. 26, 1971, 46/26697
Int. Cl. H05k *3/06*; B44d *1/092*
U.S. Cl. 156—3 **6 Claims**

A method of etching copper, or its alloys, with an acidic aqueous etching solution containing peroxysulfate and containing an additive which is an azole of the following structures:

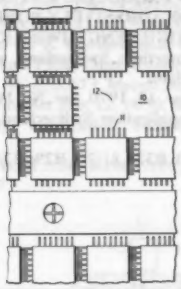


wherein X, X′ and X″ which may be the same or different represent any one of hydrogen, amino group, aminoalkyl group having one to three carbon atoms, and alkyl group having one to three carbon atoms; and, if required, one or more halides as a secondary component. The use of such etching solution results in an accelerated etching rate.

3,770,531
BONDING SUBSTANCE FOR THE FABRICATION OF INTEGRATED CIRCUITS

William Henry Craft, Somerville, and Harold Schonhorn, New Providence, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 139,008, April 30, 1971, abandoned. This application May 4, 1972, Ser. No. 250,257
Int. Cl. H01l 7/50
U.S. Cl. 156—3 5 Claims



A process is described for fabricating semiconductor elements such as integrated circuit chips from semiconductor wafers in which a hydrocarbon polymer material is used as a bonding material. This process involves incorporating circuits on a semiconductor wafer and bonding the circuit side of the semiconductor wafer to a substrate before final fabrication of the semiconductor chips. Of particular importance in this process are the physical and chemical properties of the bonding material. Atactic polypropylene is particularly suitable as a bonding material in this process.

3,770,532
POROUS BODIES AND METHOD OF MAKING

Charles P. Bean, Schenectady, and Warren DeSorbo, Ballston Lake, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 704,285, Feb. 9, 1968, abandoned. This application Feb. 16, 1971, Ser. No. 115,762
Int. Cl. B29c 17/08; G01t 5/10
U.S. Cl. 156—7 7 Claims

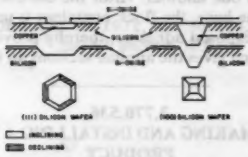
A process for making tapered holes in a solid material which contains tracks of radiation damaged material is described. One surface of the solid is contacted with an etchant while the opposite surface of the solid is contacted with an agent capable of substantially stopping the etching action of the etchant. Such an agent can be a neutralizer for the etchant or an inert medium. The etchant etches, i.e., extracts, the track-defining radiation damaged material, and upon penetrating through the solid to form a hole, it contacts the neutralizer or inert medium and its etching action is substantially stopped. The product is useful as a filter.

3,770,533
METHOD OF PRODUCING HIGH RESOLUTION PATTERNS IN SINGLE CRYSTALS

Walter K. Zwicker, Scarborough, N.Y., assignor to U.S. Philips Corporation, New York, N.Y.

Filed July 2, 1971, Ser. No. 159,204
Int. Cl. H01l 7/50
U.S. Cl. 156—17 6 Claims

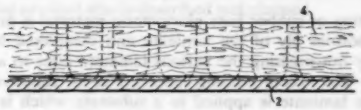
A method of producing by etching, high resolution patterns in a single metal or metalloid crystal by electrolytic displacement of portions of the metal or metalloid crystal by a different metal through an apertured mask and subsequent removal of the different metals.



3,770,534
METHOD FOR MANUFACTURING A FIBRE FLEECE LAMINATED WITH A FOIL AND A DEVICE FOR PERFORMING SUCH A METHOD

Lodewijk Anselrode, St. Anthonis, Netherlands, assignor to Stork-Amsterdam N.V., Amstelveen, Netherlands

Filed Oct. 29, 1970, Ser. No. 84,981
Int. Cl. B29j 5/00
U.S. Cl. 156—62.2 5 Claims

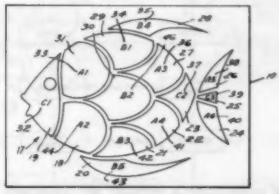


By starting from a non-bound fibre fleece one manufactures a composition consisting of a fleece strengthened at the fibre junctions with a stiffening agent and a foil, by taking care to have a discontinuous pattern of said stiffening agent available at the moment of uniting said fleece with said foil; the discontinuous pattern is obtained with a cylindrical screen with internal squeegee.

3,770,535
METHOD OF MAKING DECORATIVE ARTICLES

John R. Morrison, Syndertown Rd., Hopewell, N.J.

Filed Feb. 29, 1972, Ser. No. 230,367
Int. Cl. B44c 3/02
U.S. Cl. 156—63 11 Claims



A kit for making a decorative article includes a base; colored strips of material, each strip having a unidirectionally grained surface; a flock container; and a pair of tweezers. The base includes designated sections forming a design and a translucent pressure sensitive adhesive over the surface having the designated sections. The colored strips include designated diecut sections, the designations being correlated with the designations of the design sections. To make the decorative article, the die-cut sections are removed and placed against

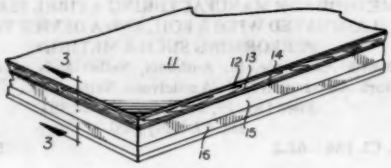
the adhesive covering their corresponding design sections on the base. The die-cut sections on the strip are oriented such that when they are fixed to the base their grains will be at different angles to one another. After the die-cut sections have been fixed to the base, the flock container is used to sprinkle flock over the exposed adhesive, thereby providing a flocculent surface which gives the applied sections an inlaid look.

3,770,536

METHOD OF MAKING AND INSTALLING A LAMINATED PRODUCT

John M. Haigh, Peabody, Mass., assignor to Parkwood Laminates, Inc., Wakefield, Mass.

Filed May 9, 1969, Ser. No. 823,274
Int. Cl. E04f *13/00*
U.S. Cl. 156—71 **2 Claims**



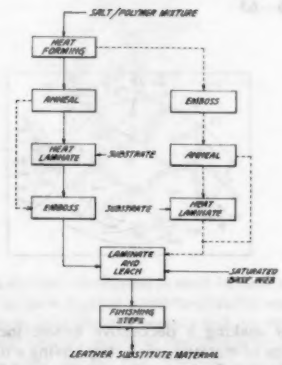
A coating or rubber base elastomeric material is provided on the bottom ply of the laminate and completed by subsequently hot pressing the various laminate plies to achieve bonding. The rubber coating functions as an adhesive layer when the laminate is applied to a substrate which is prime coated with a similar rubber base coating modified with an adhesive binder. Both prime coating and laminate coating are dry, firm and non-tacky. Adhesive bonding is achieved by mating the two coated surfaces.

3,770,537

METHOD FOR PREPARING A MICROPOROUS SHEET BY HEAT-FORMING, ANNEALING AND LEACHING

Robert L. Elton, White Bear Lake, Mich., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 867,538, Oct. 20, 1969, Pat. No. 3,640,829. This application Apr. 19, 1971, Ser. No. 135,083
Int. Cl. B29d *27/00*
U.S. Cl. 156—77 **7 Claims**



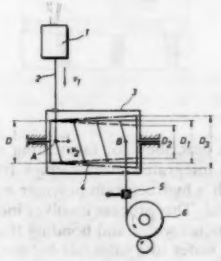
In the disclosed method of making a microporous sheet material a heat-formed (extruded, calendered, or pressed) film comprising (1) a polyurethane (preferably combined with an epoxidized soybean oil processing aid — a water insoluble plasticizer can also be included) capable of forming a non-porous film having a storage shear modulus (G') of about 0.4 to 5×10^8 dynes/cm.^{2} and a loss tangent at 0.2 cycle/sec. less than 0.5, both measured at 23° C., and (2) distributed throughout the film, a plurality of <30 micron salt (e.g., NaCl) particles, is annealed prior to leaching of the salt from the film with an aqueous medium. The resulting microporous film is useful in making leather-like sheet materials. Preferably, the film is embossed prior to leaching but after annealing.

3,770,538

METHOD OF PRODUCING A STABLE BAND CONSISTING OF ADHESIVELY BONDED STAPLE FIBERS OF HIGH LENGTHWISE STABILITY

Werner Naegeli, Winterthur, Switzerland, assignor to Pavena AG, Basel, Switzerland

Filed Mar. 13, 1970, Ser. No. 19,243
Claims priority, application Switzerland, Mar. 21, 1969, 4361/69
Int. Cl. B32b *31/20*; **B29c** *27/26*
U.S. Cl. 156—85 **24 Claims**



A method of producing a stable band composed of adhesively interconnected staple fibers of high lengthwise stability which contemplates treating the staple fibers with an excess of liquid in which an adhesive is distributed, squeezing off the liquid surplus and compressing the fibers by applying pressure into a compact band in which the adhesive binds. According to an important aspect of the invention, the band through application of a tension force is subjected to an elongation within the limits of elastic deformation while binding of the adhesive takes place.

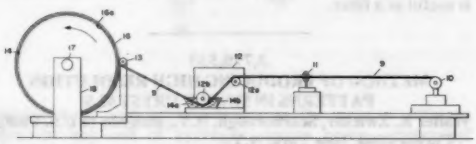
The invention also concerns a stable band of high lengthwise stability wherein the elastic elongation of the stable band, compared to one in which binding occurred in a tension-free state, is several times smaller.

3,770,539

PROCESS FOR MANUFACTURING RESIN-FILAMENT COMPOSITES

Frederick C. Bullock, Cumberland, Md., assignor to Hercules Incorporated, Wilmington, Del.

Filed Aug. 11, 1969, Ser. No. 848,778
Int. Cl. B32b *5/08*, *27/06*
U.S. Cl. 156—155 **14 Claims**



An improvement is provided in process for manufacture of resin-filament composites from one or more filamentary

strands, which comprises impregnating the strand(s) with a solvent for the resin, thereafter laying out the solvent-impregnated strand on a film of the resin, and then removing the solvent to provide residual composite as product.

Product, so produced, is also provided.

Further, a system is provided for manufacture of the composite product, including mandrel winding means, a filament strand supply means, and means intermediate the filament strand supply and the mandrel for contacting the strand with solvent for the solvent-impregnation.

3,770,540

METHOD OF SPLICING TWO LAMINATED PACKAGING MATERIALS TOGETHER

Alfred Fuchs, and Bo E. Gafvert, both of Lund, Sweden, assignors to AB Tetra PAK, Lund, Sweden

Division of Ser. No. 625,673, March 24, 1967, abandoned. This application Jan. 12, 1970, Ser. No. 7,440

Claims priority, application Sweden, Apr. 12, 1966, 4883/66

Int. Cl. B31f *5/00*; B29c *27/00*; B65d *7/34*

U.S. Cl. 156—157 **1 Claim**

Method and apparatus to splice laminated packaging material which has at least one thermoplastic layer. The packaging material is torn so that one of the layers is severed and the thermoplastic layer is stretched so that it projects beyond the severed layer and will readily heat seal to another laminated strip which has a thermoplastic layer.

3,770,541

METHOD FOR PRODUCING TUBES OF REINFORCED SETTING PLASTIC MATERIAL

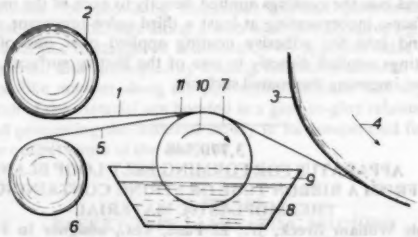
Agnar Gilbu, Sandefjord, Norway, assignor to Vera Fabrikker A/S, Sandefjord, Norway

Filed Feb. 12, 1971, Ser. No. 114,890

Claims priority, application Norway, Feb. 18, 1970, 587/70

Int. Cl. B29d *23/12*

U.S. Cl. 156—173 **2 Claims**



A tube is made by supporting a web of fibres on a series of juxtaposed strands which, impregnated in a setting plastic material, are wound on to a mandrel to form the tube and its reinforcement.

3,770,542

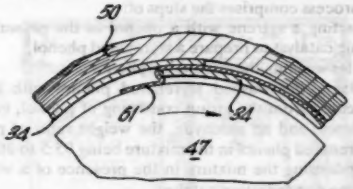
ADHESIVE TAPE AND METHOD

Joseph J. Hall, Somerville, and Leo M. Lamb, Freehold, both of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Aug. 25, 1971, Ser. No. 174,747

Int. Cl. B65h *81/02*

U.S. Cl. 156—184 **7 Claims**



A method of manufacturing rolls of pressure-sensitive adhesive tape without using preformed cores which involves first attaching a nonadhesive liner sheet to tape to be wound and then winding the liner and the tape around a mandrel in such a way that the nonadhesive liner is wound in contact with the mandrel surface and the tape is wound around the liner. The resulting product also is described and claimed.

3,770,543

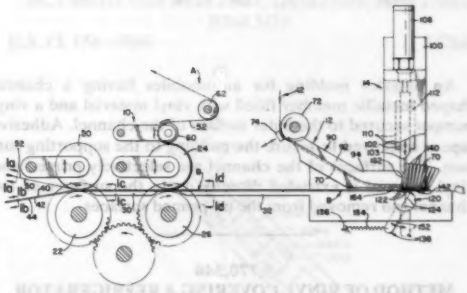
TAILORED BOW MAKING MACHINE

Richard M. Darabant, Cuyahogo, Ohio, assignor to American Greetings Corporation, Cleveland, Ohio

Filed , Ser. No. 198,858

Int. Cl. B31f *1/22*

U.S. Cl. 156—204 **18 Claims**



Apparatus is disclosed for making a decorative bow including means for bringing together in converging paths a backing strip having an adhesive surface and a decorative ribbon. The ribbon is moved more rapidly than the backing strip, and by intermittently bonding the ribbon to the adhesive surface of the backing strip a plurality of ribbon loops are formed along the backing strip. Cooperable securing means and a blade component at the looping station of the apparatus provide an improved bonding and cut off arrangement, and intermittent feeding of ribbon and continuous feeding of backing material toward the looping station is provided to improve the loop forming operation.

3,770,544

PRODUCTION OF RESIN BONDED LAMINATES

Stanley Holt, Manchester, England, assignor to Sterling Moulding Materials Limited, London, England

Division of Ser. No. 735,192, June 3, 1968, abandoned. This application Apr. 1, 1971, Ser. No. 130,486

Claims priority, application Great Britain, June 8, 1967, 26,597/67

Int. Cl. C09j *5/02*; B32b *27/42*

U.S. Cl. 156—306 8 Claims

The invention provides a process for forming a laminate, which process comprises the steps of:

a. reacting a sytrene with a phenol in the presence of an ionic catalyst to prepare a styrenated phenol,
b. water washing the styrenated phenol
c. mixing the washed styrenated phenol with a phenol selected from the group consisting of phenol, cresol and xylenol, and an aldehyde, the weight ratio of phenol to styrenated phenol in the mixture being 95:5 to 30:70
d. condensing the mixture in the presence of a volatile alkaline condensation catalyst
e. impregnating fibrous sheets with the resin product thus obtained, drying the impregnated sheets, assembling a plurality of the dried sheets and heating the assembled sheets under pressure to form the desired laminate.

The laminates so produced have good electrical properties.

3,770,545

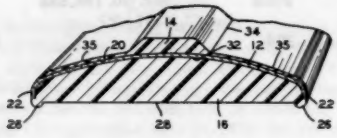
EXTERIOR MOLDING STRUCTURE AND METHOD OF MANUFACTURING SAME

Norman Charles Jackson, Sheffield Lake, Ohio, assignor to The Standard Products Company, Cleveland, Ohio

Division of Ser. No. 734,907, June 6, 1968, Pat. No. 3,543,465. This application July 9, 1970, Ser. No. 61,015

Int. Cl. B32b *31/16*; B60r *13/04*

U.S. Cl. 156—221 1 Claim



An exterior molding for automobiles having a channel shaped metallic member filled with vinyl material and a vinyl bumper secured to the outer surface of the channel. Adhesive tape is employed to secure the molding to the supporting surface. The surfaces of the channel are selectively primed and vinyl material is extruded directly on to the surfaces of the channel and removed from the un-primed surfaces.

3,770,546

METHOD OF VINYL COVERING A REFRIGERATOR DOOR PANEL

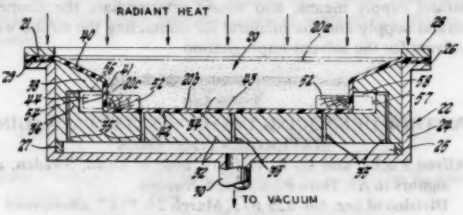
Richard Childress, Kettering, and John A. Kemper, Jr., Bellbrook, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 7, 1972, Ser. No. 216,096

Int. Cl. B29c *24/00*

U.S. Cl. 156—245 1 Claim

A vinyl plastic sheet is preformed by being positioned over a first rectangular vacuum forming female mold having undercut peripheral edges for forming a return flange border allowing the vinyl sheet to be heated and vacuum formed into a preformed cover with the aid of plug assists which are used to develop boxlike corners while preventing excess reduction in the sheet material thickness. The preformed vinyl cover is then loosely slipped over a refrigerator metal door panel on whose outer surface an epoxy adhesive solvent has been applied. The door panel and vinyl cover are next located in a



second male mold and initially heated. Upon partial shrinkage of the cover a vacuum assist is established to cause the vinyl cover to conform to the door panel and return flanges whereby ridging of the material on the underside of the return flange corner junctures is prevented.

3,770,547

COLOR BOND SURVEILLANCE SYSTEM

David H. Kelsey, Van Nuys, Calif., assignor to R & G Sloane Manufacturing Company, Inc., Los Angeles, Calif.

Filed May 14, 1971, Ser. No. 143,608

Int. Cl. B32b *7/12*; C09j *5/04*

U.S. Cl. 156—314 33 Claims

A color bond surveillance system to ensure that adequate adhesive bonding has been accomplished between two surfaces where such adequate adhesive bonding requires the application of separate coatings to each of the mating surfaces, such as a primer coating in addition to the adhesive coating, wherein one of the items being bonded contains a first color-precursor compound, the coatings separately applied to each of the mating surfaces contain a second color-precursor compound, and the adhesive coating applied over the first coating contains at least a third color-precursor compound. The at least three color-precursor compounds are co-reactive to produce a desired color different from the colors of the precursors and coating compositions when the coated surfaces are mated, thereby demonstrating proper adhesive installation.

A method for ensuring proper application of separate liquid coatings required to accomplish the satisfactory adhesion of two mating surfaces, comprising incorporating into one of the items providing one of the mating surfaces a first color-precursor compound, incorporating a second color-precursor compound into the coatings applied directly to each of the mating surfaces, incorporating at least a third color-precursor compound into the adhesive coating applied over one of the coatings applied directly to one of the mating surfaces, and super-imposing the coated surfaces.

3,770,548

APPARATUS FOR FORMING BELT LOOP BLANKS FROM A RIBBON TUBE OR STRING CONTAINING THERMOPLASTIC MATERIAL

Louis William Breck, Jr., El Paso, Tex., assignor to Farah Manufacturing Company, Inc., El Paso, Tex.

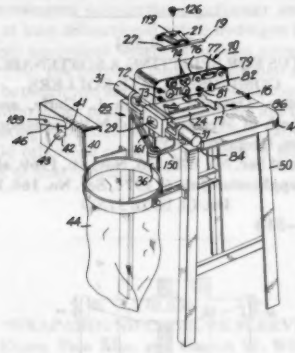
Filed July 29, 1971, Ser. No. 167,181

Int. Cl. B31f *1/12*; B26d *5/00*; B32b *31/18*

U.S. Cl. 156—353 19 Claims

A machine for crimping a garment component comprising a feed section and a die and press section, including means for

extracting a severed garment component from the die and press section, and means for controlling said machine; means



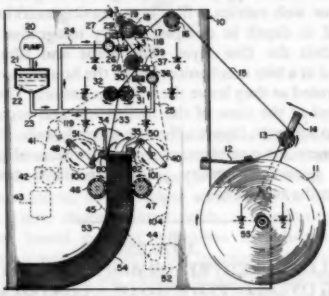
for cycling said machine in an automatic mode of operation of said machine have also been provided.

3,770,549

METHOD AND APPARATUS FOR MANUFACTURING HONEYCOMB STRUCTURES

Angelo F. Carbone, Brooklyn, N.Y., assignor to Emmanuele Fallacaro, Commack, Long Island, N.Y.

Filed Oct. 20, 1971, Ser. No. 190,856
Int. Cl. B31d *3/02*
U.S. Cl. 156—474 **10 Claims**



A method and apparatus for manufacturing honeycomb structures from a continuous web of material consisting of a machine for providing transverse parallel perforations at preselected intervals along a web of material, applying adhesive stripes in staggered relationship on opposite sides of the material, and subsequently folding the material in an accordion-like manner along the perforation lines so that adjacent faces of the material are bonded in a glue-to-glue relationship, and processing the material slowly in its compressed form at the output chute of the machine.

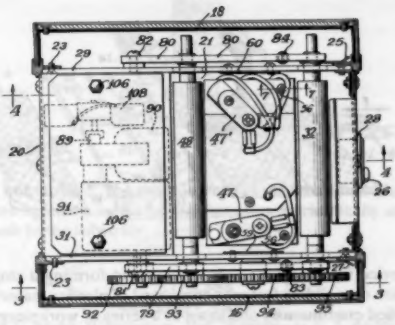
3,770,550

PACKET-TYPE LAMINATING MACHINE

Maurice D. Levitan, 218 Westmoreland Dr., Wilmette, Ill.

Filed Sept. 3, 1971, Ser. No. 177,678
Int. Cl. B30b *15/34*
U.S. Cl. 156—498 **15 Claims**

A packet-type laminating machine for laminating a card-like member, such as an identification photograph, into a pre-cut pouch or between a pair of protective sheets comprises rotatable feeding rollers and a pair of heated platens adjacent to and rearwardly oriented from the rotatable feeding rollers. The heated platens are adapted to receive the elements to be laminated carried in the packet and heat as well as apply pressure thereto. The forward portions of the heated platens are biased so as to squeeze air from between the elements prior to lamination to prevent entrapment of air between the laminated elements. A pair of expeller rollers are mounted ad-



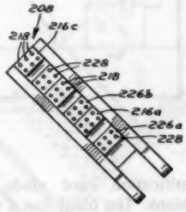
jacent the rear of the heated platens for drawing the packet containing the laminated elements from between the heated platens, and cooling means are provided adjacent the expeller rollers for cooling the laminated elements. A feeding roller and an expeller roller are mounted rotatably in a common link member in such manner that the feeding rollers will be separated from one another when the carrier or packet containing the laminated elements enters between the expeller rollers.

3,770,551

SPLICER TAPE ASSEMBLY FOR USE IN TAPE WINDING MACHINES

Gerald E. Ceroll, Minneapolis, Minn., assignor to General Mills, Inc., Minneapolis, Minn.

Division of Ser. No. 846,844, Aug. 1, 1969, Pat. No. 3,582,009.
This application Mar. 1, 1971, Ser. No. 119,913
Int. Cl. B31f *5/00*; **B32b** *31/18*; **G03d** *15/04*; **B65h** *21/00*; **B26d** *5/20*
U.S. Cl. 156—506 **3 Claims**



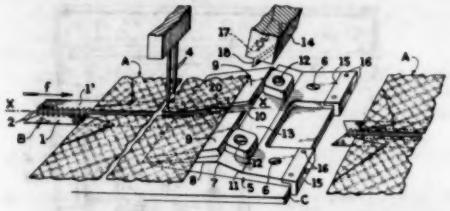
The machine winds magnetic recording tape supplied from a spool onto the reel of a tape cartridge. The loose or leading tape end is held in a displaced relation with the reel during most of winding, and after the winding has been completed, the wound tape is automatically severed from the remaining supply of tape. The resulting trailing end and the original leading end, which then abut each other, are spliced together to produce an endless tape array. The machine thereafter ejects the cartridge casing and reel.

3,770,552

DEVICE FOR CUTTING AND FORMING STOP CONNECTIONS FOR A SLIDING FASTENER CONTINUOUSLY SEWN ON A SERIES OF WORKPIECES

Guy Lacam, Paris, France, assignor to La Fermeture Ailee, Airaines, France

Filed Nov. 8, 1971, Ser. No. 196,639
Claims priority, application France, Nov. 23, 1970, 7041983
Int. Cl. B33b 31/00; A41h 37/00
U.S. Cl. 156—510 7 Claims



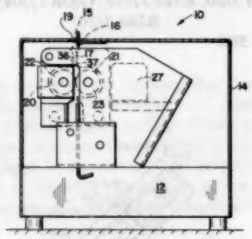
Device for simultaneously cutting and forming a stop connection on a sliding fastener composed of plastics material and supplied continuously and sewn to a series of workpieces. The device comprises a base having guide means for the fastener and an anvil fixed to the base. An element is made to undergo an alternating movement perpendicular to the plane of the anvil. The element carries means for cutting the fastener and means for forming, by a welding action, a stop connection in the fastener. The cutting means are offset from the forming means in the direction in which the fastener is guided by the guide means.

3,770,553

PORTABLE LAMINATING PRESS WITH VERTICAL FEED AND A PAIR OF LAMINATING ROLLS

Donald F. Hannon, Willoughby, Ohio, assignor to Laminex Inc, New York, N.Y.

Filed Aug. 2, 1971, Ser. No. 168,082
Int. Cl. B30b 15/34
U.S. Cl. 156—583 4 Claims



A novel identification card made from a laminated preformed card blank. The blank has a transparent envelope joined along at least one edge with a flap opening to receive personal identification data, such as the photograph of a card holder. An opaque printable core is laminated to the inner side of the envelope's upper leaf and carries such preprinted information as may be common to cards generally such as the address of the issuing institution. The card preform is personalized by insertion of the personal identification of the particular card holder.

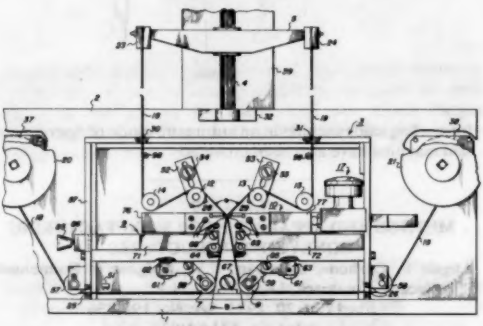
The disclosure includes a laminating system and method utilizing the novel card blank. The system uses a portable laminating press into which an unsealed card is dropped edgewise. The width of the card is vertical as it passes through a pair of closely spaced vertical heating platens. Laminating rolls engage the card and control its rate of descent or heating dwell between the platens and apply the correct laminating pressure for bonding.

3,770,554

APPARATUS FOR SPLITTING A SOFTENABLE FILM COMPRISING BITE ROLLERS

Bruce A. Jones, Ontario; William L. Goffe, and John E. Blackert, both of Webster, all of N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Continuation of Ser. No. 875,136, Nov. 10, 1969, abandoned.
This application July 6, 1971, Ser. No. 160,187
Int. Cl. B32b 31/00
U.S. Cl. 156—510 28 Claims



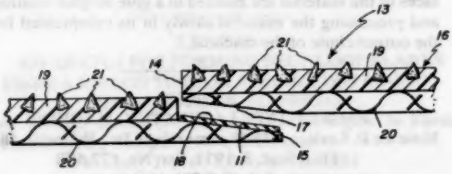
Donor and receiver webs are advanced by a common drive mechanism from supply reels through a film splitting housing. The donor web carries a film layer having marking particles dispersed in depth in complementary imagewise configurations within the film layer. The webs and film layer are laminated at a bite mechanism inside the housing and the webs are separated as they leave the bite mechanism. The film layer is softened at the time of the lamination and separation and splits into separate layers adhering to each web. The split occurs between the complementary imagewise configurations of marking particles thereby yielding positive and negative images on the two webs.

3,770,555

PARTIALLY CURED PREFORMED FILM AND ITS USE IN JOINING OVERLOPPED ENDS OF A COATED ABRASIVE ARTICLE

Matthew T. Gladstone, Scotia, and John F. Malloy, Waterford, both of N.Y., assignors to Norton Company, Troy, N.Y.

Filed June 14, 1971, Ser. No. 152,694
Int. Cl. B32b 3/10; C08g 22/00; B32b 27/40; C09j 7/00; C08g 51/12
U.S. Cl. 161—36 19 Claims



An adhesive composition, which in the preferred aspects of the invention is a partially cured reaction product thereof in

the form of a dried, heat-activatable, preformed film, is provided comprising in admixture a component having available free isocyanate groups and a poly-functional active hydrogen containing component consisting of, in combination, a hydroxyl terminated polyurethane polyester and a member containing at least difunctional active hydrogen having an active hydrogen equivalent weight of at least about 27 and less than about 500. The partially cured, preformed adhesive film, interposed between two surfaces to be joined together permits joint formation under pressure, at relatively low temperatures, thereby making it possible to join together various materials which would otherwise present a problem in joining because of their lack of heat resistance.

3,770,556

WRAPAROUND CLOSURE SLEEVE

Joseph H. Evans, Palo Alto, and Gareth W. Will, Mill Pitas, both of Calif., assignors to Reychem Corporation, Menlo Park, Calif.

Filed Aug. 7, 1970, Ser. No. 61,999
Int. Cl. B32b *3/00*
U.S. Cl. 161—39 **21 Claims**

A heat recoverable sleeve is disclosed which is capable of being installed on a longitudinal member without access to a free end. The sleeve comprises a flexible sheet of heat recoverable material having edges which may be overlapped and which have been coated with a contact adhesive. Chloroprene based contact adhesives are disclosed. The coated sheet is wrapped about the longitudinal member and the edges of the sheet are caused to adhere together by the contact cement. In order to prevent the overlapping edge from peeling back during recovery and opening the joint, a restraining member such as a sheet of metallic foil may be adhered to the overlapping edge and the region of the sleeve adjoining the underlapping edge. Alternatively, peeling back may be prevented by cross-linking the overlapping edge. Heating of the sleeve causes it to shrink onto the longitudinal member to form a secure closure.

3,770,557

HIGH TEMPERATURE INSULATION

Kareem A. Habeeb, Livonia, and Jerry E. White, Dearborn Heights, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 23, 1970, Ser. No. 83,548
Int. Cl. B32b *7/08, 15/14*
U.S. Cl. 161—54 **5 Claims**

An expanded metal mesh is corrugated so the ridges and valleys of the corrugations extend in the direction of expansion. An insulating material is applied to the mesh to form a composite insulating blanket in which the mesh is located adjacent one surface. The other surface of the composite blanket is placed against a substrate and fasteners mechanically attach the mesh to the substrate.

3,770,558

TUFTED CARPET

Roland E. Stahl, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 789,605, Jan. 7, 1969, Pat. No. 3,583,936, which is a continuation-in-part of Ser. No. 656,683, July 28, 1967, abandoned. This application Mar. 4, 1971, Ser. No. 121,209
Int. Cl. D05c *17/02*
U.S. Cl. 161—65 **3 Claims**

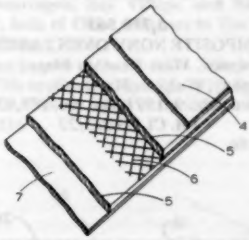
This invention relates to an adhesive composition useful for backsizing tufted carpets. The composition contains a copolymer of ethylene, a wax, and a particular resin extender blend and can be applied as a hot melt to the backside of a carpet. The composition has excellent adhesion characteristics as well as toughness, high softening point, and a suitable viscosity at coating application temperatures. Fillers can also be included in the composition as well as other ingredients.

3,770,559

PRESSURE-SENSITIVE ADHESIVE LAMINATE

Barry Sidney Jackson, Stafford, England, assignor to Evode Limited, Stafford, England

Filed Jan. 11, 1971, Ser. No. 105,576
Int. Cl. B32b *5/16, 7/06;* **C09j** *7/02*
U.S. Cl. 161—89 **5 Claims**



A waterproof pressure sensitive adhesive laminate is provided in which a flexible plastics backing sheet is coated with a bituminous adhesive composition containing a minor proportion of rubber or thermoplastic polymer. The backing sheet is reinforced with a mesh or a woven or non-woven fabric which is embedded in the sheet and provides substantial resistance to stretching.

3,770,560

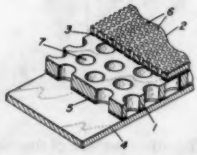
COMPOSITE LAMINATE WITH A THIN, PERFORATED OUTER LAYER AND CAVITATED BONDED BACKING MEMBER

Gerald Brent Elder, Riverdale, N.Y., and Armand Francis Lewis, Erie, Pa., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 825,565, May 19, 1969, abandoned. This application Oct. 21, 1971, Ser. No. 191,334

Int. Cl. B32b *33/00*

U.S. Cl. 161—112 **7 Claims**



Laminates comprising a thin, perforated outer layer and a thicker cavitated backing member bonded thereto, are disclosed.

3,770,561

CUT RUBBERISED STRANDED WIRE

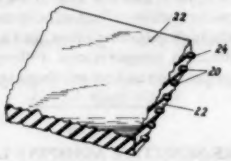
Herbert Kogert, Huttelbergstrasse 7a, 1140 Vienna, Austria

Division of Ser. No. 881,235, Dec. 1, 1969. This application Dec. 13, 1971, Ser. No. 207,078

Claims priority, application Austria, Dec. 5, 1968, A 11890/68

Int. Cl. B32b *5/08, 25/02*

U.S. Cl. 161—144 **3 Claims**



A laser cut rubberized wire, in particular serving as a reinforcing insert for a tire, comprising steel cord wire elements enclosed in a rubber coating, said wire elements having laser cut ends which are rounded or fused.

3,770,562

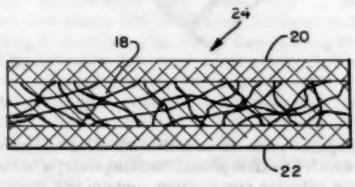
COMPOSITE NONWOVEN FABRICS

Nicholas S. Newman, West Newton, Mass., assignor to The Kendall Company, Walpole, Mass.

Filed Sept. 9, 1971, Ser. No. 178,931

Int. Cl. B32b *5/22*

U.S. Cl. 161—156 **5 Claims**



A soft and flexible spun-bond web having a cantilever drape index of not over 1.25 inches in machine or cross direction is impregnated with a soft thermoplastic binder, dried, and then plied by heat and pressure to at least one substantially binder-free fibrous layer at a temperature insufficient to cause autogenous fusion of the filaments of the spun-bond web but sufficient to cause bonding of the fibers of the fibrous layer to each other and to the spun-bond web.

3,770,563

WATER-RESISTANT CONSUMABLE CARTRIDGE CASE

Jack Bobinski, Mt. Lakes, and Jean P. Picard, Morristown, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 26, 1971, Ser. No. 109,952

Int. Cl. F42b *9/14, 39/02, 5/30*

U.S. Cl. 161—162 **7 Claims**

Novel water-resistant consumable cartridge cases are made from fibrous organic derivatives of cellulose, e.g., cellulose stearate acetate mixed ester, which absorb less than about 6 percent by weight of moisture. The cartridge cases are produced by compression molding a plastic mixture of the particulate fibrous cellulose derivative and a polymerizable composition capable of forming a rigid, cross-linked water insoluble polyurethane or other resin, and thereafter forming the resin.

3,770,564

COMPOSITE ARTICLE HAVING A HEAT-ACTIVATABLE BODY

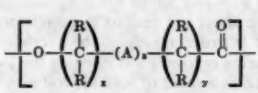
Joseph Victor Koleske, Charleston, W. Va.; Robert Dean Lundberg, Somerville, N.J.; Dale Flavian Pollart, Charleston, W. Va., and Walter Henry Smarook, Somerville, N.J., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 812,320, April 1, 1969, Pat. No. 3,641,204. This application June 3, 1971, Ser. No. 149,829

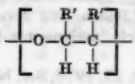
Int. Cl. B32b *9/04*

U.S. Cl. 161—183 **14 Claims**

Composite articles having at least one solid substrate of such diverse nature as glass, leather, cellulosic solids (including wood, paper, cotton and cellulose derivatives), polyamide solids, polyurethane solids, natural rubber solids, synthetic rubber solids, phenolic resin solids, epoxy resin solids, styrene polymer and copolymer solids and the like, bonded to an adhesive body which is anti-blocking (non-tacky) at ambient temperature but is heat activatable at relatively moderate temperature as low as 60° C. to provide excellent bonding upon cooling to ambient temperatures, and which comprises a cyclic ester polymer having recurring units of the formula:



wherein each R, individually, is selected from the class consisting of hydrogen, alkyl, halo, and alkoxy; A is the oxy group; x is an integer from 1 to 4; y is an integer from 1 to 4; z is an integer of zero or one; which the provisos that (a) the sum of x+y+z is at least 4 and not greater than 7, and (b) the total number of R variables which are substituents other than hydrogen does not exceed 3, with or without recurring units of the formula;



wherein each R′ is selected from the class consisting of, individually, hydrogen, alkyl, cycloalkyl, aryl, and chloroalkyl,

and, together with the ethylene moiety of the oxyethylene chain of Unit II, a saturated cycloaliphatic hydrocarbon ring having 4 to 8 carbon atoms. Also novel adhesive compositions containing the above-described cyclic ester polymer and vinyl alkyl ethers in the form of solutions, dispersions, powders, films, coatings and granules or pellets. The invention is applicable to adhering a broad range of diverse types of substrates without the necessity of using high temperatures or long setting times or toxic materials. It is also applicable to the production of heat activatable coatings or seals for diverse packaging materials, laminating uses, construction uses, investment molding type castings, and repair uses.

3,770,565

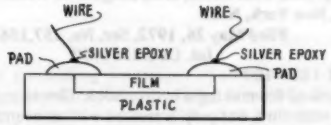
PLASTIC MOUNTING OF EPITAXIALLY GROWN IV-VI COMPOUND SEMICONDUCTING FILMS

Richard B. Schoolar; Doris S. Lequin; Harry E. Mathews, Jr., and Ronald M. Culpepper, all of Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 5, 1972, Ser. No. 215,981

Int. Cl. B01j *17/00*; **H01l** *1/00*; **B32b** *27/38*

U.S. Cl. 161—184 **12 Claims**



Epitaxial films of the formulas $Pb_xSn_{1-x}B$ and PbS_ySe_{1-y} where B is S, Te or Se, $O \leq x \leq 1$ and $O < y < 1$ were mounted on plastics.

3,770,566

INTERDIFFUSIONALLY BONDED STRUCTURES OF POLYIMIDE AND FLUOROPOLYMER

Clare William Gerow, Richmond, Va., and John Joseph Sparapany, Allegany, N.Y., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed June 8, 1971, Ser. No. 150,909

Int. Cl. B32b *27/34*

U.S. Cl. 161—189 **4 Claims**

Laminar film structures comprising polyimide interdiffusionally bonded to FEP fluorocarbon and a process for the preparation of these laminates comprising coating an organic or aqueous dispersion of FEP fluorocarbon onto a polyamide acid film and subsequently heating to convert the coated polyamide acid to polyimide.

3,770,567

LAMINATES OF SUPPORT MATERIAL AND FLUORINATED POLYMER CONTAINING PENDANT SIDE CHAINS CONTAINING SULFONYL GROUPS

Walter Gustav Grot, Chadds Ford, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 8, 1971, Ser. No. 196,772

Int. Cl. B32b *27/06*, *17/04*

U.S. Cl. 161—189 **6 Claims**

A laminate comprising a first layer of fluorinated polymer containing pendant side chains containing sulfonyl groups wherein the sulfonyl groups are in the $-(SO_3)_nMe$ form wherein Me is a metallic cation or NH_4 and n is the valence of Me and a second layer of fluorinated polymer containing pendant side chains containing sulfonyl groups wherein the sulfonyl groups are in the $-SO_2M$ form wherein M is a halogen atom, said second layer being integral with said first layer and containing support material completely encapsulated therein; and a process for preparing such; said laminate being useful as an intermediate for an ion exchange membrane.

3,770,568

GLASS SEALS

William A. Graff, Willoughby, and Jaroslaw Kohut, Parma Heights, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 888,371, Dec. 29, 1969, Pat. No. 3,669,698. This application Oct. 13, 1971, Ser. No. 188,952

Int. Cl. B32b *17/06*

U.S. Cl. 161—193 **6 Claims**

Seal glass compositions directly sealable to tantalum and suitable for use as parts of hermetically sealed tantalum electrolytic capacitors, including an effective amount of chromic oxide.

3,770,569

ASBESTOS-PLASTIC FILM LAMINATES

Richard C. Breiner, Hatboro, Pa., assignor to Nicolet Industries, Inc., Ambler, Pa.

Filed Feb. 22, 1971, Ser. No. 117,543

Int. Cl. B32b *13/04*, *19/08*

U.S. Cl. 161—205 **8 Claims**

An asbestos-plastic film laminate useful as a strippable, nonflammable wallpaper and which is dimensionally stable and mildew resistant, is made up of a first sheet of asbestos having a thickness of about 0.010 inch, a second sheet of asbestos built up and formed directly on said first sheet of asbestos, said second sheet of asbestos having a thickness of about 0.002 inch and a plastic film, e.g. a polyvinyl chloride film, applied to and affixed to the other side of said first sheet of asbestos, said plastic film having a thickness in the range from about 0.001 to about 0.003 inch.

3,770,570

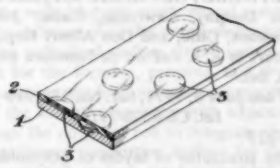
CABLE SHIELDING TAPE

Charles C. Swearingen, Bay Village, and Nicolas Sheptak, Rocky River, both of Ohio, assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 734,392, June 4, 1968, abandoned. This application Apr. 23, 1970, Ser. No. 31,386

Int. Cl. E06b *3/12*, *9/00*

U.S. Cl. 161—216 **7 Claims**



A cable shielding tape comprising a metallic strip such as aluminum and a tightly adhering layer of an adhesive copolymer of an α-olefin such as ethylene and an α,β-ethyleni-

cally unsaturated carboxylic acid such as acrylic acid is provided with zones of reduced adhesion between the metallic strip and the copolymer layer by means of a latent adhesive such as poly(vinyl acetate) or by means of a fugitive release agent such as oleic acid disposed in prescribed areas between the adhesive copolymer layer and the metallic strip. The latent adhesive material has delayed tack properties such that its adhesion to the metallic strip can be increased by the application of heat. The fugitive release agent is of a type which will become absorbed by the adhesive copolymer such that the adhesion of the adhesive copolymer to the metallic strip can be increased by the application of heat.

3,770,571

FABRICATION OF PRINTED CIRCUIT BOARDS

Henry Alsberg, Northbrook, and Ronald A. Frederiksen, Schaumburgh, both of Ill., assignors to The Richardson Company, Melrose Park, Ill.

Filed Apr. 2, 1969, Ser. No. 812,900
Int. Cl. B32b *15/08*
U.S. Cl. 161—217 **9 Claims**

The invention is directed to a printed circuit board with a substrate characterized by a polymeric hydrocarbon surface based on a conjugated diene polymer such as butadiene polymer, and a metal coating directly bonded as by electroless deposition to at least a portion of the hydrocarbon surface. In particular, the printed circuit board is characterized by a reinforced hydrocarbon substrate based on the conjugated diene polymer and an unusually superior bond between the metal and hydrocarbon surface. One method of producing the board is carried out with an uncured polymer as the hydrocarbon surface wherein after the metallizing step, the board is subjected to curing conditions to form a thermoset substrate.

3,770,572

BLENDS OF A HYDROLYZED ETHYLENE/ACRYLATE COPOLYMER AND AN ELASTOMERIC POLYMER

Raymond M. Henry, 9417 Hadley, Overland Park, Kans., and Charles F. Feldman, c/o Gulf Oil Company, P.O. Box 2100, Conroe, Tex.

Continuation of Ser. No. 865,522, Oct. 10, 1969, abandoned, which is a continuation-in-part of Ser. Nos. 710,304, March 11, 1968, abandoned, and Ser. No. 331,941, Dec. 19, 1963, abandoned. This application Oct. 4, 1971, Ser. No. 186,471
Int. Cl. C08t *37/18*
U.S. Cl. 161—217 **18 Claims**

Blended compositions comprising a hydrolyzed ethylene/acrylate polymer and an elastomeric polymer are prepared and the blended compositions employed as adhesives in the preparation of laminated structures.

3,770,573

INTERDIFFUSIONALLY BONDED STRUCTURES OF POLYIMIDE POLYMERIC MATERIAL

James Francis Dunphy, Lawrence, Kans.; John Anthony Kreuz, Columbus, Ohio, and Don Albert Roper, Belen, N. Mex., assignors to E. I. duPont de Nemours and Company, Wilmington, Del.

Filed June 8, 1971, Ser. No. 150,910
Int. Cl. B32b *27/28*
U.S. Cl. 161—227 **4 Claims**

Laminar film structures of layers of polyimide polymeric material interdiffusionally bonded together, including structures having one non-heat-sealable polyimide layer interdiffusionally bonded to a heat-sealable polyimide layer; the structures being useful in the form of narrow tapes for electrical insulation purposes such as wrapping electrical conductors.

3,770,574

COKING OF SPENT PULPING LIQUORS WITH SUBSEQUENT SO_2 ABSORPTION

Howard V. Hess, Glenham, and Edward L. Cole, Fishkill, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 780,079, Nov. 29, 1968, Pat. No. 3,607,619. This application Nov. 12, 1969, Ser. No. 875,617The portion of the term of this patent subsequent to Jan. 26, 1988, has been disclaimed.
Int. Cl. D21c *11/02, 11/14*
U.S. Cl. 162—31 **4 Claims**

Spent Sulfite liquor from a sulfite mill digester is preheated and then heated in a closed system at a temperature in the range of 450° to 700°F under autogenous pressure for a period of 0.5 minutes to six hours to form an effluent liquid and a sulfur-containing coke. The coke is burned to furnish steam for the process and flue gas from which the SO_2 evolved is absorbed by the effluent liquid thus forming additional cooking liquor which is recycled to the digester. Volatile gases from the digester are also oxidized to SO_2 which is combined with that formed by burning the coke.

3,770,575

METHOD OF MAKING A HYDROPHOBIC FIBROUS PRODUCT

Frank J. Ball, Charleston, S.C., assignor to Westavco Corporation, New York, N.Y.

Filed May 26, 1972, Ser. No. 257,156
Int. Cl. D21d *3/00*
U.S. Cl. 162—100 **6 Claims**

A method for making a hydrophobic fibrous material is disclosed wherein a wet pulp is treated with conventional chemical sizing materials and thereafter the pulp is flash dried. The sized, flash dried hydrophobic fibrous material may be used to sorb oil from the surface of water.

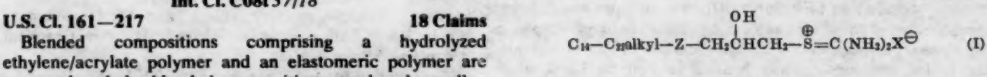
3,770,576

HIGHER ALKYL DERIVATIVES OF 2-HYDROXYPROPYLISOTHIOURONIUM SALTS AND THEIR USE IN SIZING PAPER

Bart J. Bremmer, 214 W. Meadowbrook, and Fred J. Meyer, 1108 Helen Street, both of Midland, Mich.

Filed May 1, 1970, Ser. No. 33,923
Int. Cl. D21d *3/00*
U.S. Cl. 162—158 **10 Claims**

Higher alkyl derivatives of 2-hydroxypropylisothiouronium salts of Formula I:



(I)

where Z is —O—, —S— or —NR—, and X^- is the anion of a strong inorganic acid such as the chloride ion, prepared by reacting thiourea and a substituted propylene oxide or halohydrin such as epichlorohydrin in the presence of a strong inorganic acid such as hydrochloric acid are effective sizing agents for paper and cellulosic products.

3,770,577

FIRE RETARDANT PAPER AND PAPER BOARD

Sidney Bruce Humphrey, Bel Air, Md., assignor to Humphrey Chemical Corporation, Edgewood Arsenal, Md.

Filed Sept. 23, 1969, Ser. No. 860,410
Int. Cl. D21h *3/66*
U.S. Cl. 162—159 **5 Claims**

A flame and after-glow retardant composition is prepared and incorporated into paper products. The composition is a

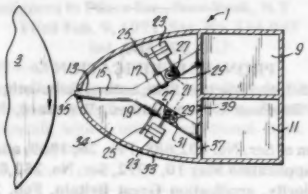
dry, powdered material consisting essentially of about 2–75 weight percent zinc borate or barium borate, 2–75 weight percent antimony oxide having a maximum particle size of 100 mesh, and 15–85 percent of a solid, suitable organic halide source.

3,770,578

METHOD FOR CONTROLLING CALIPER

William Gordon Spurrell, Lasalle, Quebec, Canada, assignor to Midland-Ross of Canada Limited, Quebec, Canada

Filed May 12, 1971, Ser. No. 142,499
Int. Cl. D21f 7/06
U.S. Cl. 162—206 **6 Claims**



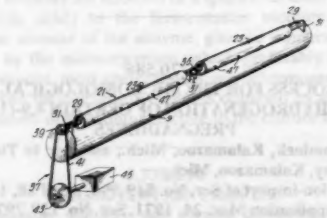
Method for controlling the caliper of sheet material being calendered by calender rolls, comprising selectively directing air at one temperature onto a region of at least one of the calender rolls corresponding to that region of the sheet passing over the roll which has a thickness different than the thickness of adjacent regions of the sheet to bring the thickness of this region of the sheet closer to the thickness of the adjacent regions, while simultaneously directing air at a second temperature onto the adjacent regions of the roll corresponding to the adjacent regions of sheet passing over the roll in order to retain the thickness of the sheet at these regions.

3,770,579

SYSTEM FOR BROKE REMOVAL

Alvis E. Cline, Mobile, Ala., assignor to Midland-Ross of Canada Limited, LaSalle, Quebec, Canada

Filed Oct. 4, 1971, Ser. No. 186,252
Int. Cl. D21f 7/04
U.S. Cl. 162—264 **4 Claims**



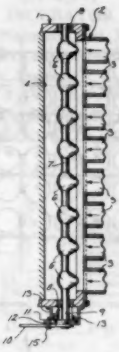
A system for assisting in removing broke from a paper or board making machine includes an elongated cylindrical member mounted on an obstruction extending transversely beneath the paper or board making machine. The elongated member can be rotated to move the broke, hung up on the obstruction, off the obstruction in order to clear the machine.

3,770,580

DIFFUSER FOR PAPER MACHINE HEADBOX

Otto J. Kallmes, Marblehead, Mass., and Richard L. Saddler, Richland, Mich., assignors to Nicolet Paper Company, Division of Milprint, Inc., Milwaukee, Wis.

Filed Oct. 18, 1971, Ser. No. 190,152
Int. Cl. D21f 1/06
U.S. Cl. 162—341 **4 Claims**



A paper machine headbox of the type having a series of inlets is provided at each inlet with a conical diffuser to divert and diffuse the incoming stock flow. The several diffusers are mounted on a common shaft which is angularly adjustable to vary the orientation of the diffusers with respect to the inlets.

3,770,581

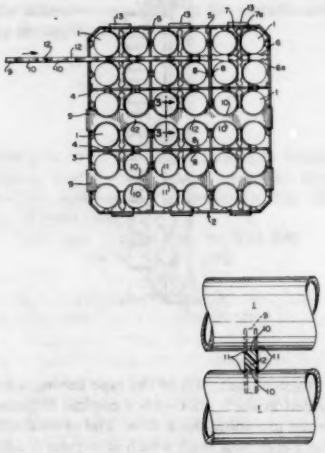
SINGLE ENDLESS STRAND MOUNTED IN A SERIES OF PARALLEL CONVOLUTIONS AS A FIBROUS WEB SUPPORTING SURFACE IN A PAPERMAKING MACHINE

Frank H. Orbison, and Howard M. Helland, both of Appleton, Wis., assignors to Appleton Mills, Appleton, Wis.

Filed Sept. 17, 1970, Ser. No. 72,998
Int. Cl. D21f 1/10, 7/12; B65g 15/12
U.S. Cl. 162—348 **14 Claims**

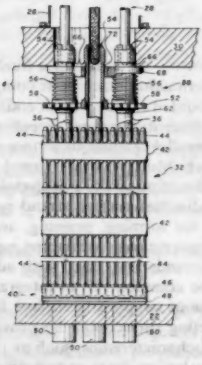
A porous supporting structure for a fluid impregnated web or sheet in a papermaking machine is composed of a a single endless strand mounted to travel in an endless path over a roll assembly with adjacent, machine direction convolutions of strand being in parallel relation to form a moving supporting surface for the web. Multiple single strand systems located in the longitudinal direction of the paper-making system can be employed, the individual endless strand systems constituting web support for the forming, pressing, and drying sections. Adjacent strand systems have a common support roll and convolutions of the strands associated with adjacent roll assemblies pass over the common roll to integrate the strands and provide a continuous supporting surface for the paper web. Each web supporting surface can be provided with areas of different physical characteristics, such as porosity, by adding or removing convolutions from certain areas of the web supporting surface or by substituting strands of different physical characteristics.

3,770,582
NUCLEAR FUEL ELEMENT WITH STRENGTHENING DURING SHIPMENT
Martin L. Rogell, Hamden, Conn., assignor to United Nuclear Corporation, Elmsford, N.Y.
Filed Nov. 4, 1971, Ser. No. 195,777
Int. Cl. G21g 3/18
U.S. Cl. 176—78 4 Claims



The nuclear fuel element has an array of parallel fuel tubes or rods arranged in parallel rows. Rigid bars having opposing semi-circular formations or scallops on their opposite edges are placed between alternate pairs of rows of the tubes, advantageously in two directions at right angles to each other. The thickness of these bars is made substantially less than the water channel spacing between the rows of tubes and both edges of these scallops are chamfered. These two factors render the tube supports or bars easily insertable prior to shipment and easily removable later on.

3,770,583
FUEL ASSEMBLY HOLD-DOWN DEVICE
Ralph H. Klumb, Simsbury, and John J. Hutchinson, Windsor, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.
Filed May 20, 1971, Ser. No. 145,374
Int. Cl. G21c 3/30, 3/32
U.S. Cl. 176—76 8 Claims



The invention provides a hold-down device which maintains a net downward force on a fuel assembly in a nuclear reactor under all thermal and hydraulic conditions in the reactor core region. The hold-down device is particularly applicable in reactors having stainless steel support barrels and Zircaloy guide tubes.

The hold-down device of the preferred embodiment of the invention is comprised of coil springs coaxially disposed about alignment posts which extend upwardly from the top end plate of each fuel assembly. A hold-down plate is slideably mounted on the alignment posts and the coil springs are interposed, in compression, between the hold-down plate and the top end plate. In use, the coil springs bias the hold-down plate upwardly against a core alignment plate to provide a downward force on the fuel assembly. The hold-down plate may also serve as a lifting surface for the fuel assembly during fuel handling.

3,770,584
PRONASE PURIFICATION
Shmuel Shaltiel, and Michael Sela, both of Rehovoth, Israel, assignors to Beecham Group Limited, Brentford, Middlesex, England
Continuation of Ser. No. 802,688, Feb. 26, 1969, abandoned. This application May 10, 1972, Ser. No. 252,051
Claims priority, application Great Britain, Feb. 29, 1968, 9,778/68
Int. Cl. C12d 9/12
U.S. Cl. 195—2 3 Claims

The antigenic materials in 6-aminopenicillanic acid and penicillins and derivatives thereof obtained by fermentation are degraded by bringing an aqueous solution of the 6-aminopenicillanic acid or penicillin or derivatives thereof into contact with water-insoluble derivative of a proteolytic enzyme. The proteolytic enzyme is preferably pronase and the water-insoluble derivative is obtained from the enzyme and bromoacetyl-cellulose or from the enzyme and sephadex or carboxymethyl-cellulose. The resulting product is unlikely to cause anaphylactic shock.

3,770,585
PROCESS FOR PREPARING L-LYSINE
Takashi Fukumura, Kamakura, Japan, assignor to Toray Industries, Inc., Tokyo, Japan
Filed Nov. 10, 1971, Ser. No. 197,487
Claims priority, application Japan, Nov. 19, 1970, 45/101472
Int. Cl. C12d 13/06
U.S. Cl. 195—29 4 Claims

L-Lysine is prepared by biochemical asymmetrical hydrolysis of α-amino-ε-caprolactam.

3,770,586
PROCESS FOR THE MICROBIOLOGICAL 1-DEHYDROGENATION OF CERTAIN 4,9-(11)-PREGNADIENES
Leo A. Kominek, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.
Continuation-in-part of Ser. No. 819,990, April 28, 1969. This application Mar. 24, 1971, Ser. No. 127,797
Int. Cl. C07c 167/14
U.S. Cl. 195—51 E 10 Claims

An improved process for the production of 11β,21-dihydroxy-1,4,17(20)-pregnatrien-3-one and 6α-methyl-11β,21-dihydroxy-1,4,17(20)-pregnatrien-3-one. The novel process of this invention provides a method whereby high substrate levels of 11β,21-dihydroxy-4,17(20)-pregnadien-3-one and 6α-methyl-11β,21-dihydroxy-4,17(20)-pregnadien-3-one are bioconverted with Septomyxa affinis to obtain cor-

responding 1-dehydro compound in high yield by employing as the substrate a 21-hydrocarbon dicarboxylic acid ester alkali metal salt of either 11β,21-dihydroxy-4,17(20)-pregnadien-3-one or 6α-methyl-11β,21-dihydroxy-4,17(20)-pregnadien-3-one to obtain the corresponding 1-dihydro compound.

The 11β,21-dihydroxy-1,4,17(20)-pregnatrien-3-one and 6α-methyl-11β,21-dihydroxy-1,4,17(20)-pregnatrien-3-one produced by the process of this invention are each known in the art. They are useful intermediates for producing valuable steroid products, for example, prednisolone and 6α-methylprednisolone, respectively.

3,770,587

CHEMICALLY MODIFIED PROTEOLYTIC ENZYMES

James F. Hamsher, and Groton Bryce E. Tate, both of Niantic, Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Feb. 9, 1971, Ser. No. 114,045
Int. Cl. C07g 7/02
U.S. Cl. 195—63 **2 Claims**

Stabilized alkaline proteolytic enzymes having increased positive charge are prepared by contacting the native enzymes with compounds which attach additional basic and onium groups to the enzymes.

3,770,588

STORAGE STABILIZATION OF CARRIER BOUND ENZYMES

Peter Salvatore Forgione, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 57,340, July 22, 1970, abandoned. This application Oct. 2, 1972, Ser. No. 294,044
Int. Cl. C07g 7/02
U.S. Cl. 195—63 **13 Claims**

A method for maintaining the catalytic activity of a hydrophilic, catalytically active carrier bound enzyme material which comprises freeze-drying the material from a solution of the substrate which is normally converted to its conversion product by the bound enzyme.

3,770,589

PROCESS FOR THE PRODUCTION OF GLUCOSE ISOMERASE

Robert E. Heady, Park Forest, and William A. Jacaway, Jr., Downers Grove, both of Ill., assignors to CPC International, Inc., Englewood Cliffs, N.J.

Filed May 20, 1971, Ser. No. 145,351
Int. Cl. C12d 13/10
U.S. Cl. 195—66 R **5 Claims**

An improved process for the production of glucose isomerase involves the addition of a specific amount of glycine (aminoacetic acid) to the fermentation medium. This increases the amount of the enzyme, glucose isomerase, that is produced by the microorganism, which preferably is a strain of Streptomyces, most preferably, *S. olivochromogenes* ATCC 21,114. Even further improvement is obtained by also adding a small amount of ammonium nitrate to the culture medium.

3,770,590

FERMENTATION PROCESS

Edward Inamine, Rahway, and Jerome Birnbaum, Marlboro Township, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 145,558, May 20, 1971, abandoned. This application Dec. 1, 1971, Ser. No. 203,838
Int. Cl. C12k 1/00
U.S. Cl. 195—80 **15 Claims**

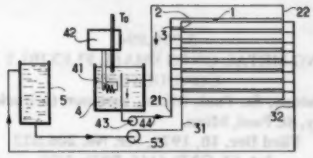
Increased yields of the antibiotic 7-(D-5-amino-5-carboxyvaleramido)-3-(carbamoyloxymethyl)-7-methoxy-3-cephem-4-carboxylic acid are obtained by the addition of sodium thiosulfate and/or α-aminoadipic acid or sodium dithionite to fermentation media composed of complex organic or chemically defined nutrients. The antibiotic which is produced by growing newly found strains of Streptomyces on suitable fermentation media is active against both gram-positive and gram-negative bacteria.

3,770,591

INCUBATOR

Robert Boirat, Chilly-Mazarin, and Jean Buissiere, Villeurbanne, both of France, assignors to Compagnie Generale D'Automatisme, Paris, France

Filed July 8, 1971, Ser. No. 160,640
Claims priority, application France, July 8, 1970, 7025329
Int. Cl. C12b 1/00
U.S. Cl. 195—139 **14 Claims**



An incubator for the development of reactions in solutions during their heat treatment is characterized by the fact that the two horizontal linings are formed by heating plates, the upper plate being held at a regulated temperature and the lower plate at a temperature lower than the regulated temperature.

3,770,592

DISTILLATION COLUMN

Marcel L. Noirot, Nemours, France, assignor to Societe de Verreries Industrielles Reunies Du Long, Levallois-Perret, France

Filed Apr. 27, 1971, Ser. No. 137,928
Claims priority, application France, Apr. 29, 1970, 7015771
Int. Cl. B01d 3/08, 3/00, 1/22; B01b 3/00
U.S. Cl. 202—236 **2 Claims**

In a cylindrical distillation column a central shaft is provided and a helical ribbon of flexible material is wound about the shaft and secured thereto to define a ramp having the desired pitch. The wound shaft is then inserted in the cylindrical column in fluid tight engagement therewith to provide a helical path for contact between the liquid phase and the vapor phase.

3,770,593

ACCELERATED TEST METHOD FOR DETERMINING COATING ADHERENCE AND ABILITY TO WITHSTAND CORROSION

Robert M. Dick, Grossee Ile, Mich., assignor to Ciba-Geigy Corporation, Greenburgh, N.Y.

Filed Oct. 1, 1971, Ser. No. 185,848
Int. Cl. G01n 27/46
U.S. Cl. 204—1 T 10 Claims

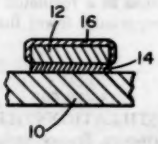
Testing of a coated sample containing a nonconductive coating and a conductive base involves exposing a coating-base interface to oxidative conditions through immersion in an electrolytic bath. The test sample is made the anode by connection to a source of direct current and the coating adjacent the interface is periodically evaluated for corrosion or blistering. Coating adherence can be determined by a tensile pull such as through a tape adhered to the coating.

3,770,594

PLATING METAL ONTO SMALL FLEXIBLY BASED CONDUCTORS

Pat F. Mentone, St. Paul, Minn., assignor to Buckbee-Mears Company, St. Paul, Minn.

Filed Dec. 10, 1971, Ser. No. 206,822
Int. Cl. C23b 5/48; B01k 3/00
U.S. Cl. 204—15 6 Claims



A process for coating metals such as gold onto very small conductors, which conductors are bonded to flexible dielectric bases by immersing the conductors in a plating solution and applying current thereto in short separated pulses so as to avoid heating and electrolyzing the solution.

3,770,595

METHOD OF TREATMENT OF STEEL PARTS IN ORDER TO INCREASE THEIR RESISTANCE TO WEAR AND ABRASION

Georges Cros, Villars, and Guy Mazet, Saint-Chamond, both of France, assignors to Centre Stephanois De Recherches Mecaniques Hydromecanique Et Frottement, Andrezieux-Boutheon, France

Filed Nov. 22, 1971, Ser. No. 200,965
Claims priority, application France, Nov. 23, 1970, 7041921; Nov. 16, 1971, 7140884
Int. Cl. C23b 5/50
U.S. Cl. 204—29 9 Claims

A method of treatment of steel parts in order to increase their resistance to wear and abrasion, comprises essentially a mechanical operation of cold-deformation of the material effecting cold-working to a depth of about 1.5 mm. to 3 mm. and a complementary mechanical operation of cold-working at the surface, effected up to about 0.2 mm. to 0.5 mm. in depth, a gradient of residual stresses being obtained such that their value on the surface is higher than 80 daN/sq.mm. and decreases to about 30 daN/sq.mm. at a depth of about 0.4 mm. These operations may optionally be followed by an electro-chemical operation at low temperature, e.g., sulphuration.

3,770,596

GOLD PLATING BATH FOR BARREL PLATING OPERATIONS

Maurice Bick, South Orange, and Jean A. Lochet, Fords, both of N.J., assignors to Auric Corporation, Newark, N.J.

Filed July 21, 1972, Ser. No. 273,860
Int. Cl. C23b 5/28, 5/42, 5/46
U.S. Cl. 204—43 G 14 Claims

An alkali gold cyanide bath particularly suited for barrel plating operations. The bath includes a chelating phosphonic acid, with quantities of hydrazine and small amounts of arsenic and/or lead ion. Bipolarity effects in plated objects are minimized through use of the composition. The bath displays reduced tendencies to attack the base metal of objects being plated or to codeposit undesired metals with the gold. Improved distribution of deposited metal is enabled with the resultant plating having excellent aesthetic qualities, and superior bake-out characteristics.

3,770,597

ELECTROLYTIC COPPER-PLATING SOLUTIONS

Michel Tixier, Billancourt, France, assignor to Regie Nationale Des Usines Renault, Billancourt and Automobiles Peugeot, Paris, France

Filed Mar. 16, 1971, Ser. No. 124,950
Claims priority, application France, Apr. 1, 1970, 7011656
Int. Cl. C23b 5/20
U.S. Cl. 204—52 R 8 Claims

Acid aqueous electrolytic copper-plating solution containing one or a plurality of copper salts, a surface-active agent and organic additives adapted to promote the deposit of bright and levelled metal, characterized in that the organic additives are both derived from a resin issuing from the condensation of two moles of formaldehyde over one mole of thiourea, the resulting product being etherified or thioetherified by one molecule having the general formula HA—R, wherein A designates a sulfur or oxygen molecule and R an aliphatic or aromatic radical.

3,770,598

ELECTRODEPOSITION OF COPPER FROM ACID BATHS

Hans-Gerhard Creutz, Westland, Mich., assignor to Oxy Metal Finishing Corporation, Warren, Mich.

Continuation-in-part of Ser. No. 11,024, Feb. 12, 1970, abandoned. This application Jan. 21, 1972, Ser. No. 219,845
Int. Cl. C23b 5/20, 5/46
U.S. Cl. 204—52 R 12 Claims

A bath for electrodepositing ductile, lustrous copper which comprises an aqueous acidic copper plating bath containing dissolved therein a brightening amount of the reaction product of polyethyleneimine and an alkylating agent which will alkylate the nitrogen of the polyethyleneimine to produce a quaternary nitrogen, wherein the reaction temperature for the imine and alkylating agent ranges from about room temperature to about 120°C and the reaction product is present in the bath in an amount from about 0.1 to 1,000 milligrams per liter.

3,770,599

ACID ZINC PLATING BATHS

Sylvia Martin, Detroit, Mich., assignor to Oxy Metal Finishing Corporation, Warren, Mich.

Continuation-in-part of Ser. No. 822,041, May 5, 1969, abandoned. This application May 24, 1971, Ser. No. 146,445
Int. Cl. C23b 5/12
U.S. Cl. 204—55 R 2 Claims

An acid zinc electroplating bath which contains a brightening amount of a soluble thiourea of the formula

$$(R)_2N—\overset{\overset{S}{\|}}{C}—N(R)_2$$

wherein R is independently selected from the groups consisting of hydrogen, alkenyl of up to 4 carbon atoms and alkynyl of up to 4 carbon atoms, provided that at least one R is alkenyl or alkynyl. The zinc plating baths may be either acid sulfate or acid fluoroborate baths and desirably contain the thiourea compound in an amount of at least about 0.01 grams per liter.

3,770,600

PROCESS FOR COLORING THE SURFACE OF ALUMINUM WORKPIECES BY ANODIZATION

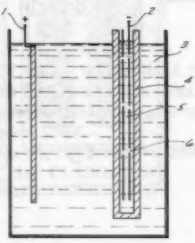
Werner Sautter, Bonn, and Ahmad Gilak, Bonn-Beuel, both of Germany, assignors to Vereinigte Aluminium-Werke Aktiengesellschaft, Bonn, Germany

Filed Oct. 8, 1970, Ser. No. 79,242

Claims priority, application Germany, Oct. 8, 1969, P 19 50 716.5

Int. Cl. C23b *9/02*

U.S. Cl. 204—58 **4 Claims**



This invention relates to the coloring of the surface of aluminum workpieces by anodization process wherein the anolyte consists principally of maleic acid with a small proportion of sulfuric acid for conductivity, and the catholyte consists of an organic acid of good conductivity or a mixture of organic acid to which a small quantity of sulfuric acid is added to conductivity. The anolyte and the catholyte are separated by a porous, ion-permeable diaphragm.

3,770,601

METHOD OF ELECTROCOATING A HEATING MEMBER WITH A DARK-COLOURED INSULATING LAYER AND HEATING MEMBER FOR AN INDIRECTLY HEATED CATHODE MANUFACTURED BY SAID METHOD

Cornelis Maan; Maria Antonius Alphonsus Andreas Collaris, and Renier Gertruda Hubertus Cocnen, all of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed June 29, 1972, Ser. No. 267,577

Claims priority, application Netherlands, July 3, 1971, 7109224

Int. Cl. B01k *5/02*; **C23b** *13/00*

U.S. Cl. 204—181 **4 Claims**

A black second layer containing xylene, petrol and tungsten powder is provided on an unsintered first insulating layer of aluminium oxide and polyvinyl acetate of a filament of an indirectly heated cathode.

3,770,602

RADIATION CROSSLINKABLE POLYMERS PREPARED BY REACTING A POLYEPOXY COMPOUND WITH AN ACRYLIC ANHYDRIDE OF A MONOCARBOXYLIC ACID

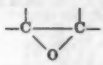
Gaetano F. D'Alelio, South Bend, Ind., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 778,825, Nov. 25, 1968, Pat. No. 3,676,398. This application Apr. 13, 1972, Ser. No. 243,819The portion of the term of this patent subsequent to July 11, 1989, has been disclaimed.

Int. Cl. C08d *1/00*; **C08g** *30/10*

U.S. Cl. 204—159.15 **8 Claims**

Crosslinkable derivatives containing acrylic ester linkages are prepared by the reaction of a polyepoxide (compounds having a plurality of



groups) with an acrylic anhydride of a monocarboxylic acid, $CH_2=C(Y)COOOCR'$. The derivatives are crosslinked readily by ultraviolet light and ionizing radiations as well as by chemical initiators, and can be used for the preparation of homopolymers and copolymers. They find utility as casting, potting, laminating and molding compounds, as coatings and impregnants, electrical insulators and the like.

3,770,603

AMPHOLYTES FOR FOCUSING ELECTROPHORESIS

Nikolaus Grubhofer, and Peter Pogacar, both of Heidelberg, Germany, assignors to said Grubhofer by said pogocar, Heidelberg, Germany

Filed July 19, 1972, Ser. No. 273,263

Claims priority, application Germany, July 28, 1971, P 21 37 617.0

Int. Cl. B01k *5/00*

U.S. Cl. 204—180 R **7 Claims**

Carrier ampholytes suitable for focusing electrophoresis of proteins and like ampholytic compounds of high molecular weight consist of aqueous solutions of aminosulfonates, aminophosphonates, and mixtures of the two with each other and/or with aminocarboxylates. As compared to the known carrier ampholytes based on aminocarboxylates alone, the carrier ampholytes of the invention show more uniform characteristics over a wider range of pH values.

3,770,604

ELECTRODEPOSITION OVER NON-CONDUCTIVE PRIMERS

Jerome A. Seiner, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

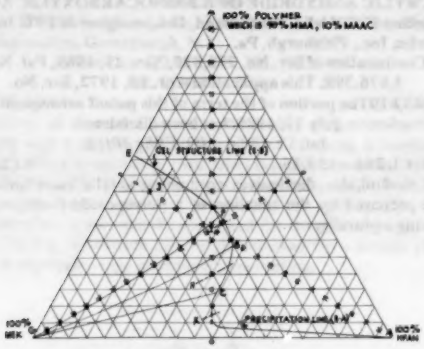
Filed Jan. 2, 1970, Ser. No. 253

Int. Cl. B01k *5/02*

U.S. Cl. 204—181 **9 Claims**

This invention relates to a novel two-coat coating system.

Particularly, this invention relates to a method of electrodepositing an electrodepositable composition over a



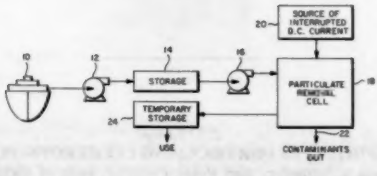
porous primer which need not be inherently conductive and to articles produced by this method.

3,770,605

APPARATUS AND METHOD FOR REMOVING SOLIDS FROM LIQUIDS

Lowell R. McCoy, Woodland Hills, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 8, 1971, Ser. No. 121,902
Int. Cl. B01d *13/02*; B03c *5/00*
U.S. Cl. 204—188 **8 Claims**



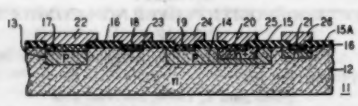
An apparatus and method for removing solid contaminants from liquids are disclosed. Removal is effected by passing the contaminated liquid between two electrodes where it is subjected to a low frequency A.C. or interrupted D.C. field. Preferred embodiments include the use of an insulated electrode and a surface for collecting solids. Multistage devices are also disclosed.

3,770,606

SCHOTTKY BARRIER DIODES AS IMPEDANCE ELEMENTS AND METHOD OF MAKING SAME

Martin P. Lepselter, New Providence, N.J., assignor to Bell Telephone Laboratories, Incorporated, Berkeley Heights, N.J.

Division of Ser. No. 755,610, Aug. 27, 1968, Pat. No. 3,585,412. This application Nov. 17, 1970, Ser. No. 90,315
Int. Cl. C23c *15/00*
U.S. Cl. 204—192 **3 Claims**



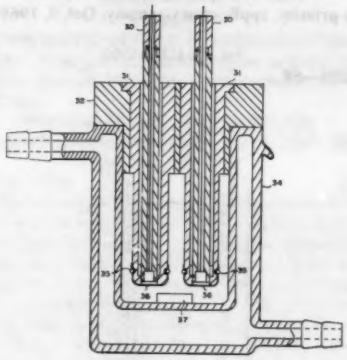
The reverse characteristic of Schottky barrier diodes provides easily fabricated, small area, high impedance elements for micropower circuits. Advantageously, the diodes are fabricated within semiconductive integrated circuit arrays by forming rhodium silicide on relatively high resistivity P-type silicon. Such diodes are particularly useful in the loads of flip-flops used as cells of a semiconductor memory.

3,770,607

GLUCOSE DETERMINATION APPARATUS

David L. Williams, Reading, Mass., assignor to The United States of America as represented by the Secretary, Dept. of Health, Education and Welfare, Washington, D.C.

Division of Ser. No. 26,362, April 7, 1970, Pat. No. 3,623,960. This application Oct. 15, 1971, Ser. No. 189,589
Int. Cl. G01n *27/46*
U.S. Cl. 204—195 P **3 Claims**



An electrochemical apparatus especially applicable for clinical use in determining glucose concentrations in solutions thereof comprising (1) a sample reservoir, (2) a glucose oxidase cell consisting essentially of a well closed at the bottom by a dialysis membrane and containing an anode, glucose oxidase and a buffer solution, (3) a reference cell consisting essentially of a well closed at the bottom by a dialysis membrane and containing an anode and buffer solution, (4) a cathode, (5) means for positioning the cells and the cathode in the sample reservoir (6) means for applying a voltage between the cathode and the anodes, and (7) means for measuring electrical current produced in the cells. The process for using the apparatus comprises adding a buffered glucose solution to the sample reservoir, immersing the cathode and cells into the solution, adding a quinone either to the cells or to the glucose solution, applying a voltage between the cathode and the anodes and measuring the current produced in the cells.

3,770,608

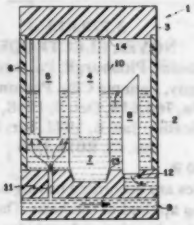
PROCESS CONTROLLER

David J. Kelch, Dayton; Walter R. Kraus, Centerville, and Jack D. Clark, Cedarville, all of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Mar. 16, 1972, Ser. No. 235,116
Int. Cl. G01n *27/46*
U.S. Cl. 204—195 M **14 Claims**

A process control apparatus detachably packaged in two integral sections. The lower section contains a compartment for a reference solution and another compartment for a process solution; the two compartments being in thermal equilibrium and having an electrical bridge therebetween. A pair of specific ion sensors extend downwardly from the upper section and reach into the two solution compartments when the controller is assembled. In operation a process solution flows through the controller and the two specific ion sensors

generate a potential difference signal for operation of a solenoid valve which controls addition of a concentration correct-



ing fluid to the process stream. There is disclosed an application of such a controller to a three stage washing system for papermaking pulp.

3,770,609

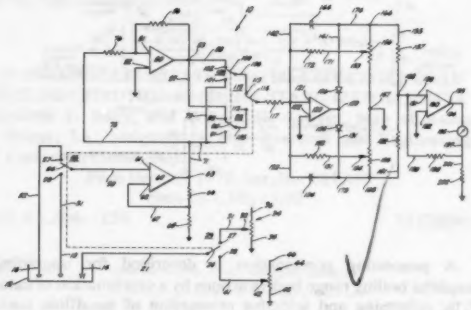
POTENTIOMETRIC CELL WITH DUAL SLOPE DISPLAY METER CALIBRATION CIRCUIT

Stanley L. Pratt, Riverside, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed May 4, 1972, Ser. No. 250,286

Int. Cl. G01n *27/46*

U.S. Cl. 204—195 M **3 Claims**



A system for performing analysis of the ion concentration of test solutions including means for sensing the potential developed between a reference electrode and an ion selective electrode immersed in the test solution, and means for amplifying and displaying the potential. The amplifier and display means include two independent span adjustment controls, each effective over part of the span of the meter. Automatic stepless transfer is provided between the two span adjustment controls, for example at mid-scale. This enables increased accuracy when displaying ion concentrations by permitting a dual slope straight line approximation to the typically nonlinear millivolt characteristic of the ion selective electrode such as occurs in the presence of interfering ions.

3,770,610

TOOL FOR MECHANICALLY AND ELECTROCHEMICALLY MACHINING THE SURFACE OF METALLIC WORKPIECES

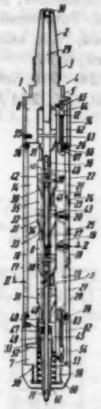
Christoph W. Gehring, Nellingen; Egbert Scholz, Hannover, and Wolfgang Strauss, Nurtingen, all of Germany, assignors to Maschinenfabrik Gehring K.G., Nellingen, Germany

Filed Nov. 2, 1971, Ser. No. 195,071

Claims priority, application Germany, Nov. 26, 1970, P 20 58 114.0

Int. Cl. B23p *1/14, 1/04*

U.S. Cl. 204—217 **33 Claims**



A tool for mechanically and electrochemically machining the surfaces of metallic workpieces in which a cylindrical body has distributed thereabout in alternating relation mechanical tool elements and electrochemical tool elements. The tool elements are radially moveable on the body and respective actuators are provided therefor with a slip clutch between the actuators so that when the electrochemical tool elements stop on the workpiece surface, the mechanical elements can continue radially outward feed movement.

3,770,611

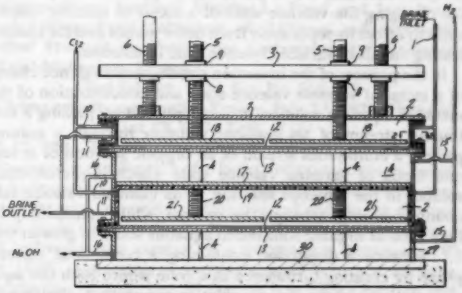
MULTIPLE TIER HORIZONTAL DIAPHRAGM CELLS

Charles E. Barnabe, Westport, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Nov. 24, 1971, Ser. No. 201,888

Int. Cl. B01k *3/10*

U.S. Cl. 204—256 **10 Claims**



A multiple tier horizontal diaphragm cell series having a top anode compartment, a bottom cathode compartment and a plurality of intermediate cell units for electrolyzing alkali

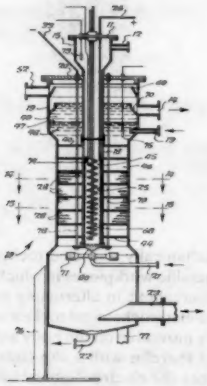
metal chloride solutions. An impervious partition divides the intermediate cell units into an upper cathode compartment containing an ion-permeable diaphragm supported by the cathode, and a lower anode compartment. The cathode compartments and the anode compartments have different outlets for the gaseous products and liquids removed from each compartment.

3,770,612

APPARATUS FOR ELECTROLYTIC OXIDATION OR REDUCTION, CONCENTRATION, AND SEPARATION OF ELEMENTS IN SOLUTION

John H. Gray; Alfred Schneider, both of Morristown, N.J.; Anthony F. Cormak, Tonawanda, N.Y., and Arnold L. Ayers, Convent Station, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Aug. 24, 1970, Ser. No. 66,310
Int. Cl. C22d *1/02*
U.S. Cl. 204—261 **22 Claims**



Apparatus for performing a liquid-liquid extraction and electrolysis comprising a closed hollow container equipped with means for countercurrently contacting streams of liquid, means for creating turbulence in the liquid mixture, means for passing an electrical charge through the liquid mixture, and means for retarding the passage of liquid through the container. In one embodiment, the means for creating turbulence in the liquid mixture comprises a rotatable shaft with agitator blades mounted thereon and, in another embodiment, comprises a pulse wave generator. The apparatus is capable of carrying out a wide variety of liquid-liquid extractions and electrolysis reactions, but is particularly applicable to processes for changing the valence state of a metal of variable valence state to effect its separation from other metals and for concentrating metals of variable valence state in solution.

In the process of the invention simultaneous valence change of a metal of variable valence state and concentration of that metal in aqueous solution is accomplished by passing a continuous stream of an aqueous solution through a column, passing a continuous stream of an organic solution of at least one metal of variable valence state which is preferentially soluble in the aqueous solution in its changed valence state countercurrently through the column, while maintaining the flow ratio of organic solution to aqueous solution greater than 1:1, forming a dispersion containing a continuous aqueous phase by creating turbulence in a zone where both the aqueous solution and the organic solution are present, allowing the dispersion to contact one electrode of an electrolytic cell which has its electrodes separated by a porous membrane, passing an electric current through the dispersion, and separating the immiscible organic and aqueous phases. This process is particularly useful to reduce hexavalent uranium to tetravalent uranium, to reduce tetravalent plutonium to trivalent plutonium, to concentrate these metals in solution in their changed valence states, and to separate plutonium from uranium.

3,770,613

NOVEL ELECTRODE

Raymond S. Chisholm, Pittsburgh, Pa., assignor to Nora International Company, Panama City, Panama

Division of Ser. No. 764,618, Oct. 2, 1968, Pat. No. 3,649,485. This application Jan. 6, 1971, Ser. No. 104,454
Int. Cl. B01k *3/06*
U.S. Cl. 204—290 R **18 Claims**

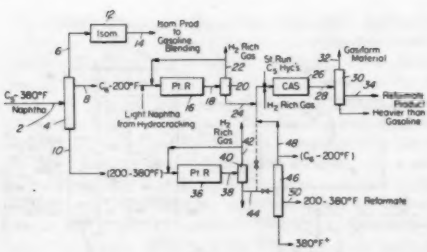
Novel electrodes are described having an electroconductive base and a coating applied to the base. The coating consists of the sulfides, nitrides, borides and carbides of the elements aluminum, tantalum, titanium, bismuth, tungsten, zirconium and hafnium mixed with the metals, oxides, sulfides, nitrides, borides and carbides of the elements gold, silver, platinum, palladium, ruthenium, rhodium, iridium, osmium, nickel, chromium, lead, copper and manganese. The use of the novel electrodes in alkali metal chlorine cells, both diaphragm and mercury type, alkali metal chlorate cells and other similar electrolytic applications is disclosed.

3,770,614

SPLIT FEED REFORMING AND N-PARAFFIN ELIMINATION FROM LOW BOILING REFORMATE

Richard G. Graven, Westmont, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 15, 1971, Ser. No. 106,837
Int. Cl. C10g *39/00*
U.S. Cl. 208—62 **19 Claims**



A processing combination is described for upgrading naphtha boiling range hydrocarbons by a combination of catalytic reforming and selective conversion of paraffinic components to enhance yield of aromatic hydrocarbons by contact with crystalline aluminosilicate catalysts having particular conversion characteristics.

3,770,615

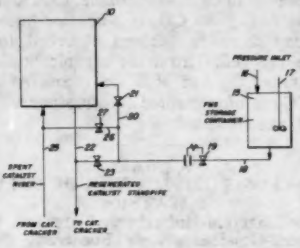
FLUID CATALYTIC CRACKING PROCESS WITH ADDITION OF MOLECULAR SIEVE CATALYST-LIQUID MIXTURE

James J. Blazek, Reisterstown, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed Oct. 22, 1971, Ser. No. 191,729
Int. Cl. C10g *11/02*
U.S. Cl. 208—120 **10 Claims**

A process for catalytic cracking of hydrocarbons wherein fluidized molecular sieve catalyst is subjected to a heat treatment procedure, such as steaming, coincidentally upon addition to an existing cat-cracker catalyst inventory. A mixture of

fluidized rare-earth-hydrogen Y catalyst and water or water-liquid hydrocarbon mixture, is injected directly into an exist-



ing hot (800°–1400°F.) fluid catalyst inventory whereupon heat treatment of the catalyst takes place within the cat-cracker unit.

3,770,616

METHOD OF REFORMING HYDROCARBONS

Naoya Kominami, Tokyo; Toshiyuki Iwaisako, and Kusuo Ohki, both of Saitama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 5, 1971, Ser. No. 140,594

Claims priority, application Japan, May 15, 1970, 45/40914; Feb. 13, 1971, 46/5972

Int. Cl. C10g *35/08*

U.S. Cl. 208—138 **1 Claim**

Method of reforming hydrocarbons which comprises treating a mixture of hydrogen and hydrocarbon at a temperature from 400°C. to 650°C. on a catalyst containing from 0.01 to 5 percent by weight of platinum, from 0.01 to 5 percent by weighth of lead and from 0.01 to 10 percent by weight of at least one member selected from the group consisting of copper, silver, gold, boron, thallium, titanium, zirconium, vanadium, tantalum, manganese, iron, cobalt, nickel, thorium, yttrium, phosphorus, antimony, cerium, scandium, gallium, indium, hafnium and niobium.

3,770,617

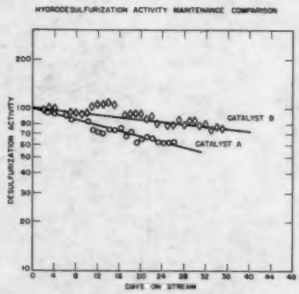
HYDRODESULFURIZATION WITH A SPECIFIED PORE SIZE DISTRIBUTION IN SILICA-STABILIZED ALUMINA

Kenneth L. Riley, and Willard H. Sawyer, both of Baton Rouge, La., assignors to Esso Research and Engineering Company, Linden, N.J.

Filed Dec. 28, 1970, Ser. No. 101,957

Int. Cl. C10g *23/02*

U.S. Cl. 208—216 **10 Claims**



Hydrodesulfurization of heavy feedstocks containing asphaltenes is carried out with a catalyst having an oxide or sulfide of Group VIB and/or Group VIII metal on an alumina stabilized with 0.5–6 percent silica by weight of the total catalyst. A major portion of the surface area of said catalyst is in pores ranging from 30–80 Angstroms in diameter, 0.5 to less than 4 percent of the total pore volume is in pores ranging from 200–2,000 Angstroms in diameter, and from 3.0 to 10.0 percent of the total pore volume is in pores greater than 2,000 Angstroms in diameter.

3,770,618

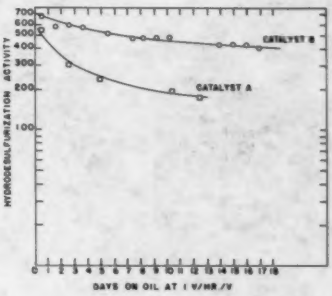
HYDRODESULFURIZATION OF RESIDUA

Clark E. Adams, Baton Rouge, La., and William T. House, Seabrook, Tex., assignors to Esso Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. Nos. 648,604, June 26, 1967, Pat. No. 3,509,044, and Ser. No. 20,847, March 18, 1970, abandoned. This application Mar. 20, 1972, Ser. No. 236,383The portion of the term of this patent subsequent to Apr. 28, 1987, has been disclaimed.

Int. Cl. C10g *23/02*

U.S. Cl. 208—216 **13 Claims**



A process for the hydrodesulfurization of residua. A residuum is contacted with a high activity maintenance catalyst comprising an oxide or sulfide of cobalt or nickel and an oxide or sulfide of molybdenum or tungsten deposited on a silica-stabilized alumina support, having a maximum of its surface area in pores having 30 to 80 A diameters. A preferred catalyst is characterized as one having at least 180 $M^2/g.$ of surface area in pores with diameters ranging from 30 to 80 A, and less than 0.25 cc./g. of the pore volume in pores having a diameter greater than 100 A.

3,770,619

PROCESS FOR HYDROCARBON PURIFICATION BY SELECTIVE HYDROGENATION

Michel Derrien, Rueil Malmaison; Hugo Van Landeghem, Vienne; Pierre Jeanjean, Meudon La Foret, and Jean Francois LePage, Rueil Malmaison, all of France, assignors to Institut Francais du Petrole des Carburants et Lubrifiants, Rueil-Malmaison, France

Filed Feb. 16, 1971, Ser. No. 115,853

Claims priority, application France, Feb. 23, 1970, 7006456

Int. Cl. C07c *7/00, 11/24*

U.S. Cl. 208—255 **20 Claims**

Process for purification of a hydrocarbon mixture by selective hydrogenation of the highly unsaturated compounds contained therein, comprising a first stage of passing the mixture in the liquid phase with a hydrogenating gas through a fixed bed hydrogenation catalyst at a temperature between −10° and 180°C and under a relatively small pressure allowing vaporization of from 5 to 50 percent b.w. of the mixture and condensing the vaporized fraction, and a second stage of passing the resulting mixture with a hydrogenating gas through a fixed bed hydrogenation catalyst at a temperature between 0° and 120°C under a higher pressure than in the first stage, at which the mixture is in the liquid phase.

3,770,620

UPGRADING AGRICULTURAL SPRAY OIL

Richard E. Ware, Trainer, and Lewis W. Hall, Jr., Chadds Ford, Pa., assignors to Sun Research and Development Co., Philadelphia, Pa.

No Drawing. Filed Aug. 24, 1972, Ser. No. 283,461
Int. Cl. C10g 29/22
U.S. Cl. 208—297 R 2 Claims

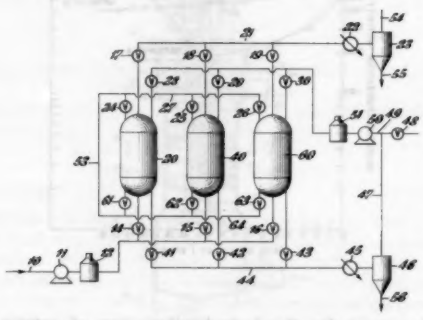
A process for raising the unsulfonatable residue and decreasing the ultraviolet light absorption of a solvent refined paraffinic oil thereby making it suitable as a high quality agricultural spray oil, by contacting said oil with a relatively small amount of bauxite.

3,770,621

HYDROCARBON SEPARATION USING A SELECTIVE ADSORPTION PROCESS WITH PURGE GAS CONSERVATION

John J. Collins, Katonah, and Raymond A. Reber, Montrose, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 22, 1971, Ser. No. 210,792
Int. Cl. C07c 7/12
U.S. Cl. 208—310 3 Claims



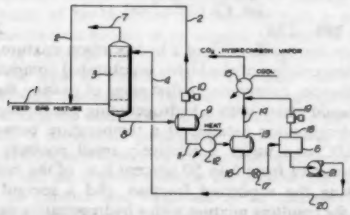
Normal paraffins are separated from mixtures thereof with non-normal hydrocarbons in a vapor phase, isothermal, isobaric, non-sorbable purge process in which three or more fixed bed molecular sieve adsorbers are operated so that as each adsorber undergoes its adsorption-fill step which displaces the purge gas, another receives that purge gas to displace its void space hydrocarbon vapors, or to assist in purge desorption.

3,770,622

TREATMENT OF WET NATURAL GAS MIXTURES TO RECOVER LIQUID HYDROCARBONS

Ernest Freireich, Los Angeles, and Henry J. Klooster, Buena Park, Calif., assignors to Fluor Corporation, Los Angeles, Calif.

Filed Dec. 28, 1970, Ser. No. 101,495
Int. Cl. C10g 5/04
U.S. Cl. 208—340 4 Claims



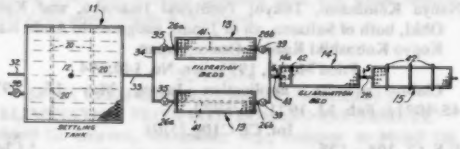
Natural gas mixtures containing predominantly methane but also appreciable amounts of heavier hydrocarbons so as to be "wet" are contacted with organic liquids having combined oxygen and in which CO_2 and H_2S are relatively more soluble than methane. CO_2 and H_2S present are dissolved in the CO_2-H_2S-organic liquid solution. Dry methane rich gas is obtained, absorbed liquid hydrocarbons are recovered from the organic liquid for their gasoline value, CO_2 and H_2S are recovered as gaseous products. CO_2 is often vented to atmosphere and the organic liquid is recirculated.

3,770,623

SYSTEM FOR PURIFICATION OF POLLUTED WATER

Kathe Seidel, Krefeld-Hulserberg, Germany, assignor to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V.

Filed May 1, 1972, Ser. No. 248,994
Claims priority, application Germany, June 15, 1971, P 21 29 660.6, P 21 29 711.0; Sept. 30, 1971, P 21 48 996.3; Dec. 20, 1971, P 21 63 283.7
Int. Cl. C02c 1/02
U.S. Cl. 210—2 38 Claims



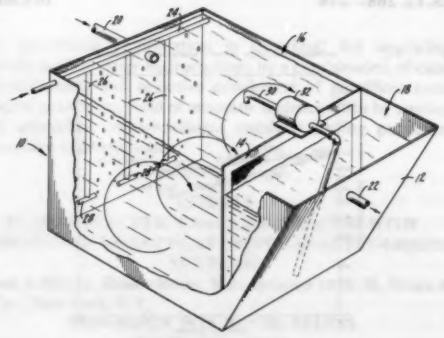
Method and apparatus for removal of suspended and dissolved pollutants from water by flow of water over and through beds having suitable vegetation rooted and growing therein. Suspended and dissolved material are removed in separate beds using different types of vegetation. Where the pollutant is sewage, potable water can be produced.

3,770,624

METHOD FOR TREATING WATER CONTAINING SUSPENDED SOLIDS FROM A SANITARY SYSTEM

James W. McKibben, Brian L. Goodman, and Robert B. Higgins, Overland Park, Kans., assignors to Ecodyne Corporation, Chicago, Ill.

Filed Dec. 14, 1970, Ser. No. 97,977
Int. Cl. C02c 1/12
U.S. Cl. 210—8 16 Claims



The invention provides an improved method and apparatus for treating water containing suspended solids from a sanitary system. In carrying out the method, the water is aerated and delivered to a screen with a directional component across the screen surface and a direc-

tional component through the screen. The screen has openings large enough to pass the majority of the solids suspended in the water, and has the ability to hold a coating of these solids on its upstream side. The flow of water is controlled so that a coating of the suspended solids from the water is formed on the screen surface. The delivery of water containing these suspended solids to the screen is continued with a directional component across the screen and a directional component through the screen, whereby to filter solids from the water passing through the coating and screen. The relationship between the directional components across and through the screen is controlled to maintain the coating on the screen. The water that is passed through the screen is stored, and is recycled to the sanitary system.

3,770,625
REMOVAL OF VIRUS FROM FLUIDS

Craig Wallis and Joseph L. Melnick, Houston, Tex., assignors to The Carborundum Company, Niagara Falls, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 311,015, Nov. 30, 1972, which is a continuation of application Ser. No. 135,464, Apr. 19, 1971, both now abandoned. This application Mar. 16, 1973, Ser. No. 341,816

Int. Cl. B01d *15/06*

U.S. Cl. 210—36 **7 Claims**

A medium for adsorbing virus is contacted with an inorganic hydrolyzing composition thereby forming a treated medium having improved virus adsorbing properties. The treated medium is contacted with a fluid containing viruses whereby the viruses are removed from the fluid.

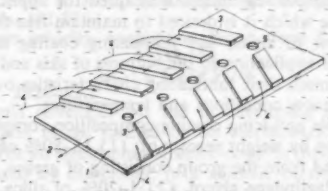
3,770,626
SORBENT BELT

Ray R. Ayers, Houston, Tex., assignor to Shell Oil Company, New York, N.Y.

Filed Oct. 26, 1971, Ser. No. 192,429

Int. Cl. B01d *33/14;* **E02b** *15/04*

U.S. Cl. 210—40 **9 Claims**



Apparatus and method for removing a polluting liquid from a water surface, the apparatus being composed of a sorbent body shaped to form free flow paths which move the pollutant into increased contact with the sorbent body; the method involving a sorbent body shaped to form free flow paths and moving the sorbent body through the water to cause the pollutant to flow in the free flow paths to increase contact with the sorbent body.

3,770,627
CONTAINING AND REMOVING OIL SPILLS ON WATER

Henry E. Alquist and Robert T. Werkman, Bartlesville, Okla., assignors to Phillips Petroleum Company

No Drawing. Filed Dec. 7, 1971, Ser. No. 205,740

Int. Cl. E02b *15/04*

U.S. Cl. 210—40 **8 Claims**

A method is provided for containing oil on a water surface and removing the oil from the water surface by fusing a finely particulate polyolefin floating on the surface with the oil to incorporate the oil into a crust-like fused mass which will act to form a boundary against extension of the oil mass and which can be easily skimmed from the water surface.

3,770,628
METHOD OF TREATING OIL-CONTAINING CONTAMINATED DRAINAGE

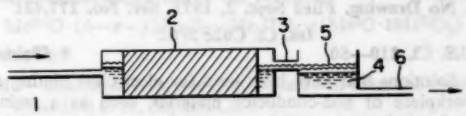
Jiro Yamamoto and Kazuo Minakawa, Yokohama, Hideki Nishikado, Kawasaki, and Shintaro Imon, Yokohama, Japan, assignors to Nippon Oil Company, Limited, Tokyo, Japan

Filed July 10, 1972, Ser. No. 270,081

Claims priority, application Japan, July 16, 1971, 46/52,450; Jan. 21, 1972, 47/7,669

Int. Cl. B01d *17/04*

U.S. Cl. 210—40 **11 Claims**



Oil-containing contaminated drainage can be effectively clarified by passing the same through a wax-filled bed. In the preferred embodiment the treatment of oil-containing contaminated drainage as set forth above is carried out by the use of combination process selected from (a) a wax-filled bed—an active carbon bed process, (b) a sand-filter—a wax-filled bed process, and (c) a sandfilter— a wax-filled bed—an active carbon bed process.

3,770,629
MULTIPLE MATRIX MAGNETIC SEPARATION DEVICE AND METHOD

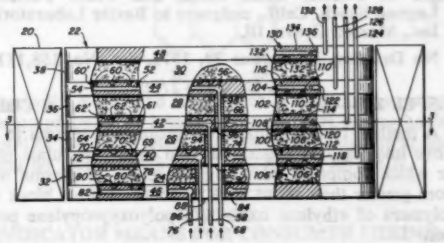
John J. Nolan, Randolph, and Peter G. Marston, East Gloucester, Mass., and Laszlo M. Lontai, South Bend, Ind., assignors to Magnetic Engineering Associates, Inc., Cambridge, Mass.

Filed June 10, 1971, Ser. No. 151,765

The portion of the term of the patent subsequent to Dec. 14, 1988, has been disclaimed

Int. Cl. B01d *17/06*

U.S. Cl. 210—42 **20 Claims**



A multiplex matrix magnetic separation device and method including electromagnetic coil means for providing a magnetic field volume in the space encompassed by the electromagnetic coil means, a plurality of magnetic matrices stacked within the space encompassed by the electromagnetic coil means, a plurality of flow control means disposed between the magnetic matrices and one on each end of the stack of the magnetic matrices, each of the flow control means disposed between the magnetic matrices including a distribution network for distributing the slurry which undergoes magnetic separation to the corresponding adjacent magnetic matrix and a collection network for collecting the slurry from the

other corresponding adjacent magnetic matrix after the slurry has undergone separation, one of the flow control means at one end of the stack of magnetic matrices including one of the distribution and collection networks and the other of the flow control means at the other end of the stack includes the other of the networks, inlet means for delivering slurry which is to undergo separation to the distribution networks and outlet means for receiving from the collection networks slurry that has undergone separation.

3,770,630

TREATMENT OF ELECTROLESS PROCESS AND STRIPPING SOLUTIONS

David R. Kamperman, Harmony, Pa., assignor to Dart Industries Inc., Los Angeles, Calif.

No Drawing. Filed Sept. 2, 1971, Ser. No. 177,421

Int. Cl. C02c *5/02*

U.S. Cl. 210—50 8 Claims

Solutions that have been used for electroless plating a workpiece of non-conductor material, such as a resin, or for stripping metal from a workpiece are treated in such a manner that they may be discharged as non-polluting waste into a natural body of water. A used solution is first provided in a condition involving a pH of not greater than 8 or 9, with an optimum of below 5, and then if it contains dissolved metal above about 5 g./l., it is diluted with water before further treatment. The solution is then heated to a temperature of at least 120° F. and maintained at such a temperature, while providing alkalinity and using an excess of sodium hydrosulfite of at least about 50 mg./l., but preferably higher, up to a maximum of about 500 mg./l. The solution is then allowed to settle and is decanted with less than one mg./l. of dissolved metal content, and with precipitated solid metal waste being thus removed. Subsequently, the thus treated solution may be recirculated and if necessary, further conditioned for its particular use and then employed in an applicable rinsing operation. On the other hand, if desired, it can be discharged as a substantially non-toxic waste solution.

3,770,631

CLARIFICATION OF BLOOD SERUM AND PLASMA

Lajos F. Fekete, Costa Mesa, and Frans Peetoom, Laguna Beach, Calif., assignors to Baxter Laboratories, Inc., Morton Grove, Ill.

No Drawing. Filed June 29, 1971, Ser. No. 158,111

Int. Cl. C02b *1/20*

U.S. Cl. 210—53 2 Claims

A method of clarifying blood serum and plasma to remove undesired proteinaceous and lipid particulate matter which comprises admixing the serum or plasma with from greater than about 20% to about 30% of block copolymers of ethylene oxide and polyoxypropylene polymer.

3,770,632

MICELLAR FLUIDS FOR INJECTION WELL STIMULATION AND OIL RECOVERY

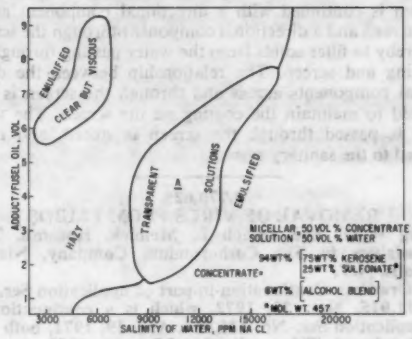
James D. Gilliam and Dwight L. Dauben, Tulsa, Okla., assignors to Amoco Production Company, Tulsa, Okla.

Continuation-in-part of abandoned application Ser. No. 38,366, May 18, 1970. This application Mar. 6, 1972, Ser. No. 231,850

Int. Cl. B01j *13/00*; E21b *43/20*

U.S. Cl. 252—8.55 D 10 Claims

Micellar solutions highly stable to a wide range of temperatures, high shear rates through an orifice and salt concentrations up to about 15,000 p.p.m. are prepared from a hydrocarbon oil, a surfactant, and a cosurfactant, the latter being composed of an ethylene oxide adduct



of a preferentially oil-soluble primary alcohol and a C_4 to C_8 alcohol. In cases of high water content solutions, i.e., 90–95% water, the hydrocarbon may be omitted.

3,770,633

ANTI-ICING AND LUBRICATING COATING COMPOSITIONS

Danforth Holley, Grosse Pointe Shores, and John W. Nika, Leonard, Mich., assignors to Danforth Holley, Grosse Pointe Shores, Mich.

No Drawing. Filed Nov. 2, 1971, Ser. No. 194,901

Int. Cl. C10m *1/10, 3/02, 5/02*

U.S. Cl. 252—28 7 Claims

Anti-icing coating materials adapted for application to ayn surface which it is desired to maintain free from ice, frozen snow or slush, and lubricating coating materials adapted for application to the bottoms of skis and the like which maintain their lubricating characteristics over wide ranges of snow conditions and temperatures.

A suitable anti-icing coating composition comprises the combination by weight percent of; (1) 15–80% of a lubricant selected from the group consisting of grease, mineral oil and polyethylene glycol, (2) 1–20% of silica, (3) 1–10% of a trialkyl substituted phenol, (4) 1–20% of an organo polysiloxane and (5) from 0.5 to 10% of a binder and plasticizer selected from the group consisting of primary, secondary and tertiary amines, azoles, azolines, oxazolines, glyoxalines, azines, amides, oxazines, indoles and morpholines.

3,770,634

GREASE COMPOSITION

Stanley Charles Dodson, Leatherhead, and Kenneth James Hole, Wokingham, England, assignors to The British Petroleum Company Limited, London, England

Filed Nov. 30, 1971, Ser. No. 203,395

Claims priority, application Great Britain, Dec. 1, 1970, 56,965/70

Int. Cl. C10m *5/08, 7/12*

U.S. Cl. 252—29 3 Claims

Oleophilic graphite thickened grease containing a small amount of petroleum paraffinic wax.

3,770,635
SUBMERSIBLE MOTOR SEAL FLUID AND SECTION
Jorge B. Atendido, St. Paul, and Robart L. Hansen, Roseville, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Jan. 24, 1972, Ser. No. 220,353
Int. Cl. C10m 1/38
U.S. Cl. 252—48.6 6 Claims

A seal section for a submersible pump motor filled with a lubricating and cooling fluid comprising a solution of a fluoroaliphatic radical-substituted polymer in a normally liquid fluorinated solvent, which seal section prevents ingress of ambient well fluid into the motor along an operating shaft and also accommodates expansion and contraction of the volume of said fluid due to on-and-off cycling of the motor.

3,770,636
DISPERSION FOR HOT ROLLING ALUMINUM PRODUCTS
Ewell E. McDole, Danville, and Frank L. Howard, Livermore, Calif., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.
No Drawing. Filed Nov. 15, 1971, Ser. No. 198,898
Int. Cl. C10m 1/22, 3/10, 3/16
U.S. Cl. 252—49.5 11 Claims

This invention relates to an oil-in-water dispersion for the hot rolling of aluminum in which the oil phase contains from 2 to 85% fatty alcohols and from 5 to 95% polybutene. The dispersion provides for improved lubrication properties for hot rolling and improved surface characteristics of the resultant sheet products.

3,770,637
LIQUID DEVELOPER FOR DEVELOPING ELECTROSTATIC LATENT IMAGE
Zenjiro Okuno, Akinori Mizuno, and Ikuyo Kondoh, Tokyo, Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan
No Drawing. Continuation-in-part of application Ser. No. 828,784, May 28, 1969, now Patent No. 3,640,863, dated Feb. 8, 1972. This application Sept. 16, 1971, Ser. No. 181,216
Claims priority, application Japan, June 5, 1968, 43/38,516
Int. Cl. G03g 9/04
U.S. Cl. 252—62.1 3 Claims

A liquid developer for use in developing an electrostatic latent image formed on an electrostatic recording material or an electrophotographic copying material which is prepared by dispersing, in a suitable carrier liquid, a toner consisting essentially of pigment particles whose surfaces are coated with a coating agent, said coating agent consisting of a first resin having a high solubility in said carrier liquid and a second resin having a low solubility in said carrier liquid.

3,770,638
LIQUID DEVELOPERS CONTAINING METAL SALTS OF ACID DYES
Jonas J. Chechak, St. Petersburg Beach, Fla., assignor to Eastman Kodak Company, Rochester, N.Y.
No Drawing. Continuation-in-part of abandoned application Ser. No. 864,299, Oct. 3, 1969. This application Nov. 3, 1971, Ser. No. 195,458
Int. Cl. G03g 9/04
U.S. Cl. 252—62.1 8 Claims

Liquid developers for use in developing electrostatic charge patterns are comprised of an electrically insulating carrier liquid having dispersed therein certain metal salts of water-soluble acid dyes as colorants. The metal salts of water-soluble acid dyes are prepared by reacting the dye with a water-insoluble amine to form a water-insoluble amine salt of said dye, dissolving the salt, adding a metal acetate to the solution and heating the mixture to form the metal salt of the dye.

3,770,639
HEXAGONAL FERRITES
Takeo Okazaki, Naotaka Sakakibara, and Takashi Okada, Tokyo, Japan, assignors to Nippon Electric Company Limited, Tokyo, Japan
Filed Jan. 21, 1971, Ser. No. 108,370
Claims priority, application Japan, Jan. 23, 1970, 45/6,647; Feb. 10, 1970, 45/12,079; Mar. 20, 1970, 45/24,313, 45/24,320; Sept. 22, 1970, 45/83,588; Oct. 23, 1970, 45/93,851
Int. Cl. H01f 1/10
U.S. Cl. 252—62.57 3 Claims

Hexagonal ferrites are disclosed having essentially the compositions expressed by the formula

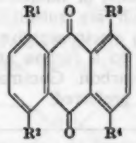
$$Me^{III}O \cdot (6-x-y)Fe_2O_3 \cdot xMe_2^{IV}O_3 \cdot y(Me^{I}O \cdot \delta Me^{II}O_2)$$

wherein

Me^{III} denotes at least one element selected from the group consisting of Sr, Ba, and Ca,
Me^{IV} denotes at least one element selected from the group consisting of Al, Cr, and Ga,
M^{I} denotes at least one element selected from the group consisting of Ni, Cu, Zn, Co, and Mg,
Me^{II} denotes at least one element selected from the group consisting of Ge and Ti,
x and y denote mol number lying within the ranges of $0<x\leq 1.40$ and $0<y\leq 0.6$, respectively, and δ denotes the $Me^{I}O:Me^{II}O_2$ mol substitution ratio lying within the range of $0.6\leq\delta\leq 1.4$.

3,770,640
REFRIGERANTS COLORED FOR LEAK INDICATION
Philip Lee Bartlett, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Filed Nov. 22, 1971, Ser. No. 201,120
Int. Cl. C09k 3/02
U.S. Cl. 252—68 15 Claims

Refrigerants, refrigeration oils and refrigerant-refrigeration oil mixtures containing anthraquinone dyes having the structure



wherein R^1, R^2, R^3 and R^4 are each H or an anilino group, substituted by from 1 to 3 saturated alkyl groups having a total of from 4 to 24 carbon atoms, and wherein at least 2 and no more than 3 of R^1, R^2, R^3 and R^4 are H.

3,770,641
INDICATOR MEANS FOR CONSUMER MIXING OF MULTI-COMPONENT SYSTEMS
Abraham Cantor, Elkins Park, Pa., and Murray W. Winicov, Flushing, N.Y., assignors to West Laboratories, Inc., New York, N.Y.
No Drawing. Continuation-in-part of application Ser. No. 169,518, Aug. 5, 1971, which is a continuation of application Ser. No. 758,663, Sept. 10, 1968, both now abandoned. This application Mar. 2, 1972, Ser. No. 231,413
Int. Cl. C11d 17/04
U.S. Cl. 252—90 8 Claims

In the packaging of multi-component systems wherein at least one component alone and/or in excessive proportion to other components can be topically hazardous or otherwise detrimental, but can be rendered harmless when properly mixed with other components, the improvement

that comprises incorporating in at least one of the components to be combined an indicator providing a characteristic color when exposed to an excess of said detrimental component and losing said characteristic color upon elimination of excess of said detrimental component. In instances where multi-component systems contain more than one individually detrimental component with such detrimental characteristics being overcome in proper mixing thereof, there should be present a separate colorimetric indicator of excess for each such detrimental component. The improvement is particularly adapted for use with multi-component systems which are packaged in containers having compartments separated by means permitting mixing of the components to homogeneity within the container prior to use, and with the outer container having translucent to transparent qualities sufficient to permit viewing of the colorimetric indicator means as components are being mixed.

3,770,642

SYNERGISTIC ANTISEPTIC COMPOSITIONS CONTAINING CERTAIN HYDROXYCARBANILIDES

Eric Jungermann and Robert E. Casely, Chicago, Ill., assignors to Armour-Dial, Inc., Chicago, Ill.

No Drawing. Filed Apr. 15, 1971, Ser. No. 134,402

Int. Cl. C11d *3/48, 9/50*

U.S. Cl. 252—107 **6 Claims**

Compositions possessing antibacterial activity through the effects of synergistic combinations of hexachlorophene and either 3,4,5 - trichloro-3'-trifluoromethyl-N-hydroxycarbanilide or 3,3',4,4'-tetrachloro-N-hydroxycarbanilide.

3,770,643

BIODEGRADABLE HARD WATER DETERGENTS

El-Ahmadi Ibrahim Heiba and Albert Lloyd Williams, Princeton, N.J., assignors to Mobil Oil Corporation

No Drawing. Filed Dec. 21, 1970, Ser. No. 100,543

Int. Cl. C11d *9/30*

U.S. Cl. 252—117 **14 Claims**

A novel class of biodegradable detergents having improved resistance to precipitation in hard water are the water-soluble ionic salts or nonionic esters or amides of alkanoic acids which are substituted by at least one group containing an electronegative atom, said substitution being attached to a carbon atom 2 to 5 positions from the carboxyl carbon. Gamma-substituted alkanoic acid derivatives are preferred.

3,770,644

SODIUM TRIPOLYPHOSPHATE

Wilhelm Huttinger, Engenhahn, Taunus, Heinz von Almasy, Wiesbaden-Biebrich, and Joachim Buchwald, Wiesbaden, Germany (all % Chemische Werke Albert, Wiesbaden-Biebrich, Germany)

No Drawing. Filed Feb. 16, 1971, Ser. No. 115,768

Claims priority, application Germany, Feb. 17, 1970, P 20 07 044.4; Jan. 16, 1971, P 21 01 951.2

Int. Cl. C01b *25/38;* **C11d** *3/06*

U.S. Cl. 252—135 **7 Claims**

A process of increasing the hardness of sodium tripolyphosphate hollow spheres which comprises spray-drying a solution of mono- and disodium phosphate which has been adjusted to a ratio of Na:P of approximately 5:3 to yield a spray product which contains more than 10% by weight condensed phosphate, calcining the spray product and treating the calcinate at a temperature of less than 80° C. with sufficient moisture to yield a product having an ash loss of 0.2 to 7% by weight and a detergent composition containing this sodium tripolyphosphate hollow spheres as an essential ingredient.

3,770,645

HARDENER COMPOSITION FOR URETHANE RESIN

Satoru Enomoto and Hisayuki Wada, Iwaki, and Mikio Fujioka and Masao Koguro, Tokyo, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

No Drawing. Filed Sept. 14, 1971, Ser. No. 180,476

Claims priority, application Japan, Sept. 14, 1970, 45/80,757

Int. Cl. C07c *125/04;* **C08k** *1/82*

U.S. Cl. 252—182 **5 Claims**

This invention is a hardener composition for use with urethane resin which is odorless; exhibits superior weatherfastness and workability; is manufactured inexpensively; and which is substantially free of poisonous properties.

3,770,646

ACTIVATED CHLORATE

Harold de Vere Partridge, Wilson, N.Y., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Filed Feb. 16, 1971, Ser. No. 115,730

Int. Cl. A61l *13/00*

U.S. Cl. 252—187 **4 Claims**

Activated alkali metal chlorate compositions for use in bleaching processes are produced by dissolving an amount of an activator selected from the water soluble salts of silver, manganese, arsenic, hexavalent chromium and vanadium pentoxide in an aqueous solution of an alkali metal chlorate and co-precipitating the activator in homogeneous admixture with the chlorate salt.

3,770,647

SHAPED ACCEPTORS FOR BINDING AND REMOVING SULFUR OXIDES FROM FLUE GASES AND PROCESS FOR THEIR MANUFACTURE

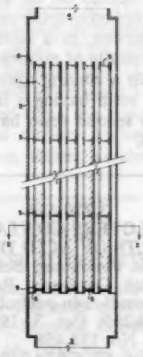
Fritz M. Dautzenberg, Herman W. Kouwenhoven, and Jaap E. Naber, Amsterdam, Netherlands, assignors to Shell Oil Company, New York, N.Y.

Filed July 27, 1970, Ser. No. 58,461

Claims priority, application Netherlands, July 29, 1969, 6911550

Int. Cl. B28b *1/50;* **C09k** *3/00*

U.S. Cl. 252—190 **11 Claims**



A process is disclosed for the manufacture of shaped articles which are suitable to be used as solid acceptors in gas cleaning processes by mixing a dehydrated refractory oxide with a ceramic binder, forming the mixture into a shaped article, heating the shaped article to a tem-

perature to form a ceramic article, impregnating with a metal compound, and then calcining the formed, impregnated article.

3,770,648

ANHYDROUS AEROSOL FOAM

Leonard Mackles, New York, N.Y., assignor to Bristol-Myers Company, New York, N.Y.

No Drawing. Filed July 12, 1971, Ser. No. 161,869

Int. Cl. C09k *3/30*

U.S. Cl. 252—305 5 Claims

A pressurized aerosol container in which is included a substantially anhydrous aerosol foaming composition adapted to produce a quick breaking foam and comprising a foamable liquid and a silicone resin as foaming agent.

3,770,649

FLOODING WITH MISCIBLE-TYPE FLUID SLUGS HAVING DIFFERENT BRINE TOLERANCES

David N. Burdge, Denver, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Continuation-in-part of abandoned application Ser. No. 665,078, Sept. 1, 1967, and a division of application Ser. No. 19,573, Mar. 16, 1970, now Patent No. 3,623,553, dated Nov. 30, 1971. This application July 9, 1971, Ser. No. 161,315

Int. Cl. B01j *13/00*

U.S. Cl. 252—312 7 Claims

Micellar dispersions useful in flooding subterranean formations and desirably having a particular brine tolerance permitted by the components within the micellar dispersion are obtained by utilizing low average equivalent weight surfactants to obtain a high brine tolerance and increasing average equivalent weight surfactant to obtain lower brine tolerances. These dispersions are injected and displaced through the formation to give improved oil recoveries.

3,770,650

PROCESS FOR PREPARING A CONCENTRATED COLLOIDAL SILICON DIOXIDE SOLUTION

Johannes Ebregt, Heilo, Netherlands, assignor to Akzo N.V., Arnhem, Netherlands

No Drawing. Filed June 16, 1971, Ser. No. 153,901

Claims priority, application Netherlands, June 26, 1970, 7009423

Int. Cl. B01j *13/00*; C01b *33/14*

U.S. Cl. 252—313 S 7 Claims

In the process for preparing concentrated colloidal silicon dioxide solutions by mixing an aqueous alkali-metal silicate solution with an aqueous silicon dioxide sol and then passing the resulting reaction mixture through an ion exchanger in the hydrogen form so that the effluent of the latter is a silicon dioxide sol which may be mixed with additional alkali-metal silicate solution and recirculated through the exchanger until the effluent attains a desired silicon dioxide content; the stability of the resulting sols is improved and the further concentration thereof, as by evaporation, is facilitated by maintaining constant the rates of addition of the alkali-metal silicate solution and of passage of the reaction mixture through the exchanger, at least until the effluent of the latter has a silicon dioxide content of approximately 4 percent by weight, by maintaining the temperature of the reaction mixture in the range between 60 and 100° C. and its pH value in the range from 6 to 10, and by selecting the silicon dioxide content and rate of addition of the alkali-metal silicate solution and the quantity of water in the system so that the rate of increase of silicon dioxide in the effluent from the exchanger, in percent by weight per minute, is in the range between 0.03 and 1.0, and preferably between 0.05 and 0.5.

3,770,651

DELAMINATION OF MICA BY MOLTEN SALTS

Stanley Eugene Bakes, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Nov. 24, 1971, Ser. No. 201,974

Int. Cl. B03d *1/10*

U.S. Cl. 252—378 R 7 Claims

Delamination of mica is effected by treatment of the mica with inert molten salts at temperatures of from about 500° C. to about 1000° C. and subsequent removal, e.g. dissolution, of the salts.

3,770,652

GLASSY SILICATE CORROSION INHIBITOR WITH CONTROLLED SOLUTION RATE

Robert Cornelius Gordon, Jr., Rochester, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.

No Drawing. Filed June 12, 1972, Ser. No. 261,626

Int. Cl. C23f *11/18*

U.S. Cl. 252—387 13 Claims

The corrosion of metals, especially copper, in an aqueous system is inhibited by treating the water with a glassy, controlled solubility rate, silicate composition consisting essentially of SiO_2 and metal oxides in a molar ratio of SiO_2 to metal oxide of from about 1.35:1.0 to about 1.0:1.35 wherein the preferred metal oxides are K_2O, Na_2O, and CaO.

3,770,653

NEMATIC LIQUID CRYSTAL COMPOSITIONS

Yoshio Katagira and Yoshio Miyata, Sendai, Japan, assignors to Kabushiki Kaisha Daini Seikosha and Kabushiki Kaisha Hattori Tokeiten, both of Tokyo, Japan

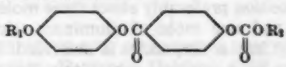
No Drawing. Filed Apr. 9, 1971, Ser. No. 132,816

Claims priority, application Japan, Apr. 17, 1970, 45/32,386

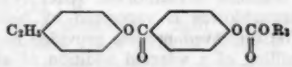
Int. Cl. C07c *69/00*; C09k *3/00*

U.S. Cl. 252—408 5 Claims

Nematic liquid crystal compositions having a liquid crystal range including ambient temperature are disclosed. The compositions include at least one compound having the general chemical formula



wherein R_1 and R_2 are alkyl groups such as $H(CH_2)_n$, and at least one compound having the general chemical formula



wherein R_3 is alkyl group such as $H(CH_2)_n$.

3,770,654

NEMATIC LIQUID CRYSTAL

Yoshio Katagiri and Yoshio Miyata, Sendai, and Osamu Nagasaki, Narashino, Japan, assignors to Kabushiki Kaisha Daini Seikosha and Kabushiki Kaisha Hattori Tokeiten, both of Tokyo, Japan

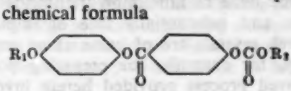
No Drawing. Filed Apr. 27, 1971, Ser. No. 137,980

Claims priority, application Japan, May 2, 1970, 45/37,201

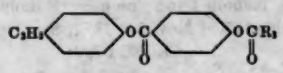
Int. Cl. C09k *3/00*; C07c *69/00*

U.S. Cl. 252—408 4 Claims

Nematic liquid crystal compositions having a liquid crystal range including ambient temperature are disclosed. The compositions include at least one compound having the general chemical formula



wherein R_1 and R_2 are alkyl groups having the general formula $CH_3(CH_2)_n$, and at least one compound having the general chemical formula



wherein R_3 is either n-C_4H_9 or n-C_5H_{11}.

3,770,655

AMMONIA OR AMINE MODIFIED ORGANO-MAGNESIUM CATALYST COMPOSITIONS

Edwin J. Vandenberg, Foulk Woods, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

No Drawing. Continuation-in-part of application Ser. No. 5,149, Jan. 22, 1970, which is a continuation-in-part of application Ser. No. 694,374, Dec. 29, 1967, both now abandoned, which in turn is a continuation-in-part of application Ser. No. 18,888, Mar. 31, 1960, now Patent No. 3,415,761. This application Oct. 19, 1971, Ser. No. 190,689

Int. Cl. C07f *3/02*; C08g *23/14*

U.S. Cl. 252—431 N 5 Claims

Certain modified organomagnesium compounds have been discovered, which are particularly useful as polymerization catalysts. These new catalyst compositions comprise the reaction product of an organomagnesium compound such as a dialkylmagnesium with ammonia or an amine which has at least two sites for reaction with the organomagnesium compound admixed with an inert organic diluent and/or a complexing agent for the modified organomagnesium compound.

3,770,656

PROCESS FOR PRODUCING TITANIUM TRICHLORIDE-ALUMINUM TRICHLORIDE IN CONTROLLED PROPORTIONS

Arthur P. Haag, Moraga, and Meyer Weiner, Orinda, Calif., assignors to Dart Industries Inc., Los Angeles, Calif.

Filed Feb. 9, 1970, Ser. No. 9,613

Int. Cl. B01j *11/78*

U.S. Cl. 252—442 8 Claims

An improved process for producing co-crystals of titanium trichloride and aluminum trichloride with a desired composition preferably about three moles of titanium trichloride and one mole of aluminum trichloride, and substantially free of impurities is described. Such crystals are of value as a catalyst, particularly, for example, for preparing polypropylene. The co-crystals are prepared by reacting titanium tetrachloride with aluminum in an excess of titanium tetrachloride. After reaction, excess titanium tetrachloride is vaporized by heating the co-crystals. The improved process provided herein involves dry ball milling of a selected addition of aluminum trichloride with the co-crystals after formation, for enriching the co-crystals back to stoichiometry to compensate for aluminum trichloride volatilized in the drying operation.

3,770,657

REMOVAL OF TITANIUM TETRACHLORIDE FROM TITANIUM TRICHLORIDE-ALUMINUM TRICHLORIDE

Arthur P. Haag, Moraga, and Meyer Weiner, Orinda, Calif., assignors to Dart Industries Inc., Los Angeles, Calif.

Filed Feb. 9, 1970, Ser. No. 9,614

Int. Cl. B01j *11/78*

U.S. Cl. 252—442 3 Claims

An improved process for producing co-crystals of titanium trichloride and aluminum trichloride with a composition of substantially three moles of titanium trichloride and one mole of aluminum trichloride or other desired ratio, and substantially free of impurities is described. Such crystals are of value as an active catalyst, particularly, for example, for preparing polypropylene. The improved process provided herein involves the removal of traces of titanium tetrachloride from already formed co-crystals by ball milling the co-crystals in the presence of a sufficient quantity of aluminum powder to substantially quantitatively react with titanium tetrachloride.

3,770,658

AMMONIA SYNTHESIS CATALYST

Atsumu Ozaki, Tokyo, Ken-Ichi Aika, Numazu, Akio Furuta, Yokohama, and Akio Okagami, Tokyo, Japan, assignors to Japan Gasoline Co., Ltd., Tokyo, Japan

No Drawing. Filed June 21, 1971, Ser. No. 155,222

Claims priority, application Japan, June 22, 1970, 45/54,511; May 22, 1971, 46/34,981, 46/34,982

Int. Cl. B01j *11/06, 11/40, 11/82*

U.S. Cl. 252—443 8 Claims

In synthesizing ammonia through reaction between nitrogen and hydrogen, it is possible to effect said synthesis at a lower temperature by the use of a catalyst comprising at least one element selected from the group consisting of transition metals belonging to VI–B group, VII–B group and VIII group of Periodic Table and at least one element selected from the group consisting of alkali metals, both of said elements being substantially in metallic state, together with a promoter or a support in addition thereto as occasion demands.

3,770,659

AUTO EMISSIONS CATALYST

Lee A. Cosgrove, Westchester, and James E. McEvoy, Springfield, Pa., assignors to Air Products and Chemicals, Inc., Wayne, Pa.

No Drawing. Filed Oct. 1, 1971, Ser. No. 185,906

Int. Cl. B01j *11/06, 11/08*

U.S. Cl. 252—465 2 Claims

The active catalyst for burning pollutants exhausted from an internal combustion engine consists essentially of sorptive alumina matrix, from about 5 to about 18 weight percent manganese monoxide, from about 2 to about 8 weight percent chromium sesquioxide, and from about 0.01 to about 0.2 weight percent palladium, the unit weight ratio of manganese monoxide to chromium sesquioxide being greater than about 2 and less than about 3.5, and the total weight of such 2 oxides being from about 8 to about 24%.

3,770,660

CATALYST AND PROCESS FOR DOUBLE BOND ISOMERIZATION

Donald C. Tabler, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed Oct. 5, 1970, Ser. No. 78,209

Int. Cl. B01j *11/06, 11/82*

U.S. Cl. 252—467 15 Claims

A catalyst comprised of a uranium oxide and an oxide of one of phosphorus, arsenic, antimony, or bismuth, on a support, is employed for double-bond isomerization of cycloalkadienes, alkenes, alkylcycloalkenes, alkadienes, and the like.

3,770,661

ARYLENEISOPROPYLIDENE COPOLYMERS

André Fritz, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation of application Ser. No. 93,426, Nov. 27, 1970. This application May 22, 1972, Ser. No. 255,902

Int. Cl. C08g *25/00*

U.S. Cl. 260—2 R 20 Claims

Aryleneisopropylidene copolymers are provided such as those derived, for example, from p-bis(2-chloroisopropyl) benzene and diphenylether, having an inherent viscosity sufficiently high to form a solid copolymer which may be fabricated into shaped structures. A process and a catalyst system for preparing said copolymers are also provided; said process including reacting monomers such

as p-bis(2-chloroisopropyl)benzene and diphenylether at a temperature of −40° C. in the presence of a catalyst comprising triphenylmethylhexafluoroarsenate, $AlCl_3$ and nitrobenzene.

3,770,662
FOAMED ELASTOMERIC PRODUCT AND METHOD OF MAKING THE SAME
Leo E. Hennessy, Chagrin Falls, and John A. Morris III, Streetsboro, Ohio, assignors to Industrial Electronic Rubber Company, Twinsburg, Ohio
Filed May 10, 1971, Ser. No. 141,706
Int. Cl. C08d *13/10;* **C08f** *47/10, 29/16*
U.S. Cl. 260—2.5 S **12 Claims**

A fluoroelastomeric article is extruded or otherwise molded, and cured, and subsequently blown to produce an enlarged foamed elastomeric product of predetermined conformation.

3,770,663
PRODUCTION OF FOAMED BEADS
Shiro Ueki, Tadayuki Fukuda, and Yoshimitsu Miyata, Yokkaichi, Japan, assignors to Kabushiki Kaisha Oji Yuka Goseishi Kenkyujo, Tokyo-to, Japan
No Drawing. Filed Nov. 2, 1971, Ser. No. 195,051
Int. Cl. C08j *1/14*
U.S. Cl. 260—2.5 B **9 Claims**

A dispersion of crystalline polymer particles in a medium is held in a high-pressure region at a pressure above the saturate vapor pressure of the dispersion and at a temperature below the melting point of the polymer and of a value at which crystallization of the polymer progresses thereby to cause infiltration of the dispersion medium into the polymer particles due to volumetric shrinkage of the polymer accompanying crystallization thereof and thereby to form a dispersion of foamable polymer particles, and this dispersion is ejected from the high-pressure region into a low-pressure region at a pressure below the saturated vapor pressure of this dispersion and at a temperature lower than the melting point of the polymer.

3,770,664
CATALYST AND PROCESS FOR POLYMERIZING EPOXY COMPOUND USING SAID CATALYST
Koji Chono and Toshiaki Matsuo, Kanagawa, Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan
No Drawing. Filed Dec. 29, 1971, Ser. No. 213,820
Claims priority, application Japan, Dec. 29, 1970, 46/121,602; Feb. 22, 1971, 46/8,014, 46/8,015, 46/8,016
Int. Cl. C08g *23/14*
U.S. Cl. 260—2 A **30 Claims**

A novel catalyst comprising a reaction product among an organoaluminum compound, a phosphorus compound having at least one P—OH linkage in the molecule, and a compound selected from thiuram compounds, benzothiazyl sulfenamides, dithiocarbamates, xanthogenates, salts of benzothiozole, and salts of benzoimidazole. An epoxy compound can be polymerized to a high-molecular-weight polymer in excellent yields using said catalyst.

3,770,665
PROCESS OF MAKING AN OPEN-CELLED VINYL CHLORIDE POLYMER PLASTISOL
Wolfgang Jurgeleit and Hermann Winter, Marl, Germany, assignors to Chemische Werke Huls, Marl, Germany
No Drawing. Filed May 26, 1972, Ser. No. 257,245
Claims priority, application Germany, May 29, 1971, P 21 26 950.1
Int. Cl. C08j *1/16*
U.S. Cl. 260—2.5 P **1 Claim**

Sold polymers and copolymers of vinylchloride having particularly utility in the preparation of open-cell soft foam materials are prepared by emulsifying a dispersion of material selected from the group consisting of vinylchloride monomers and a mixture of vinylchloride monomers and unsaturated polymerizable compounds with an emulsifier mixture comprising:

(a) The calcium salt of an alkyl benzenesulfonic acid having 8–16, preferably 12 carbon atoms in the alkyl chain;

(b) A compound having the formula

$$R—(A)_x—O—(CH_2—CH_2—O)_n—H$$

wherein

A represents a C=O group or a phenyl group,
R represents an alkyl group having 8–20, preferably 12–18 carbon atoms,
n represents integers from 4 to 12, preferably 4 to 6, and
x stands for zero or 1

wherein the emulsifier mixture is about 0.1 to 5 percent by weight of the material and the weight ratio of (a) to (b) is about 2:1 to 1:2, and drying the emulsified polymerized dispersion by atomization to produce the solid polymers and copolymers. The emulsifier mixture may be added to the dispersion of material before polymerization, after polymerization, or a portion may be added before and another portion after polymerization.

3,770,666
VINYL ALCOHOL COPOLYMER ION-EXCHANGE MEMBRANES
Jean-Pierre Quentin, Lyon, France, assignor to Rhone-Poulenc S.A., Paris, France
No Drawing. Filed Oct. 12, 1970, Ser. No. 80,216
Claims priority, application France, Oct. 17, 1969, 6935725
Int. Cl. C08f *15/02, 27/00, 27/12*
U.S. Cl. 260—2.1 E **11 Claims**

Ion-exchange membranes particularly useful for deionisation or organic solvents are made from crosslinked vinyl alcohol polymers containing ion-exchange groups.

3,770,667
PHONOGRAPH RECORD ADDITIVE
Don C. Tucker, Hacienda Heights, Calif., assignor to ABC Dispersion Chemical Co., Los Angeles, Calif.
No Drawing. Filed Oct. 1, 1971, Ser. No. 185,803
Int. Cl. C08f *21/02;* **C08g** *17/00*
U.S. Cl. 260—22 CB **16 Claims**

The disclosure describes a fluid phonograph record additive comprising about 30–90% grinding vehicle and about 10–70% carbon black, said carbon black having an average particle diameter of less than nine and preferably less than 1 millimicron. The use of the foregoing fluid additive in vinyl plastic phonograph records results in phonograph records which may be produced more efficiently and which have low noise and improved processability.

3,770,668
STYRENE POLYMER FOAM AND THE PREPARATION THEREOF
John M. Corbett, Marlin G. Bussey, and Graydon Wayne Killingbeck, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed Oct. 29, 1970, Ser. No. 85,258
Int. Cl. C08f *33/02, 45/30, 47/10*
U.S. Cl. 260—2.5 E **9 Claims**

Stable, low density, small cell size styrene polymer foam is extruded in large sections employing a carefully selected blowing agent and an intimate dispersion of the blowing agent with the styrene polymer while in heat plastified form.

3,770,669

PROCESS FOR THE MANUFACTURE OF CELLULAR PLASTICS FROM POLYAMIDES

Eckart Reske, Hofheim, Taunus, Harald Cherdron, Naurod, Taunus, and Ludwig Brinkmann and Walter Herwig, Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Apr. 14, 1972, Ser. No. 244,282
Claims priority, application Germany, Apr. 16, 1971, P 21 18 509.1
Int. Cl. C08g *53/08*
U.S. Cl. 260—2.5 D **8 Claims**

There is disclosed and claimed a process for the production of cellular plastics from polyamides, which exhibit melting ranges near to or above their decomposition temperatures or poor or no solubility at all in solvents or which exhibit both of these properties at the same time, the process which comprises processing polyamides carrying substituents at the amide nitrogen, from the melt or from the solution and splitting-off partially or totally the N-substituents to yield cellular plastics by the foaming action of the unsaturated compounds which originate from the N-substituents during the splitting-off process. This foaming action is augmented by additionally using foaming or expanding agents and/or reducing the pressure during the splitting-off process.

3,770,670

PROCESS FOR THE PRODUCTION OF OPEN-CELL SOFT FOAM MATERIALS FROM VINYL CHLORIDE POLYMER PLASTISOL

Burkhard Kuhlow, Gelsenkirchen, Arnold Polte, Recklinghause, and Alfred Michels, Marl, Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

No Drawing. Filed May 26, 1972, Ser. No. 257,246
Claims priority, application Germany, May 29, 1971, P 21 26 951.2
Int. Cl. C08j *1/16*
U.S. Cl. 260—2.5 P **5 Claims**

In a process of making a plasticized vinyl resin open-cell sponge which comprises mechanically frothing a plastisol comprising 100 parts by weight of a particulate thermoplastic vinyl resin selected from the group consisting of polyvinylchloride and copolymers of vinylchloride, and from 50–200 parts of high boiling organic liquid plasticizer for the resin and thereby incorporating a surrounding gas into the mixture, subsequently heating the resulting froth at a temperature and for a time sufficient to fuse the resin particles with the plasicizer while maintaining the froth structure, and cooling the resulting material to room temperature, the improvement comprising adding about 0.5 to 2.5 percent by weight based on the vinyl resin of an emulsifier mixture to the plastisol during the mechanical frothing, said emulsifier mixture comprising:

(a) about 30–80 percent by weight of the calcium salt of n-dodecylbenzenesulfonic acid; and
(b) about 70–20 percent by weight of a compound having the general formula

$$R—O—(CH_2—CH_2—O)_nH$$

wherein R represents an unbranched alkyl group having 8–20 carbon atoms, and *n* represents integers from 6–16.

3,770,671

POLYURETHANES PRODUCED OXYALKYLATED RESOLES

James L. McFarling, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation

No Drawing. Filed Aug. 14, 1972, Ser. No. 280,688
Int. Cl. C08g *22/14, 22/44*
U.S. Cl. 260—2.5 AP **4 Claims**

This disclosure concerns polyurethanes formed by the reaction of oxyalkylated, resole-based polyols and polyisocyanates. The resoles used have a structure comprising, by weight, 40 to 70% monomeric trimethylol phenol and dimeric resoles; 15 to 30% dimethylol phenol and trimeric resole polymers; 5 to 10% monomethylol phenol, tetrameric and larger resole polymers and 1% or less phenol.

3,770,672

PASTE FOR GUMMED TAPE AND PROCESS FOR PRODUCING THE SAME FROM HYDROLYZED STARCH

Atsushi Yoshizawa and Takaji Kitazawa, Shizuoka, Japan, assignors to Nihon Rika Seishi Kabushiki Kaisha, Tokyo, Japan

No Drawing. Filed Feb. 10, 1971, Ser. No. 114,342
Int. Cl. C08f *15/00*
U.S. Cl. 260—17.4 ST **13 Claims**

A process for producing a gummed tape paste having a remoistenable adhesive property which comprises copolymerizing a decomposition product obtained by the enzymatic decomposition of starch with a vinyl monomer and the gummed tape paste thus produced.

3,770,673

CHITOSAN GRAFT COPOLYMER FOR MAKING PAPER PRODUCTS OF IMPROVED DRY STRENGTH

Robert Clayton Slagel, 2430 Berkshire Drive, Pittsburgh, Pa. 15241, and Gloria Di Marco Sinkovitz, 443 Washington Ave., Bridgeville, Pa. 15017

No Drawing. Application Nov. 4, 1971, Ser. No. 195,815, now Patent No. 3,709,780, which is a continuation-in-part of application Ser. No. 160,097, July 6, 1971. Divided and this application Oct. 3, 1972, Ser. No. 294,757
Int. Cl. C08b *23/00*
U.S. Cl. 260—17.4 GC **4 Claims**

Paper products exhibiting markedly improved dry strength properties are produced by adding to the cellulose paper dispersion a chitin-based compound comprising a graft copolymer of 2-acrylamido-2-methylpropane sulfonic acid onto a chitosan substrate.

3,770,674

METHOD OF MANUFACTURING A LATEX HAVING HIGH CONCENTRATION OF POLYMER PARTICLES AND LOW VISCOSITY EMPLOYING SOLUBLE ALGINATE AND MAGNESIUM SALTS

Yoshihiko Araki, Yokohama, Hisatake Sato, Tokyo, and Mikio Takahashi, Yokohama, Japan, assignors to Nippon Oil Company, Limited, Tokyo, Japan

No Drawing. Filed Apr. 1, 1971, Ser. No. 130,495
Int. Cl. C08d *3/06, 9/06*
U.S. Cl. 260—17.4 BB **2 Claims**

A method of directly producing synthetic rubber latex having a high concentration of large polymer particles and a low viscosity characterized by polymerizing aliphatic conjugated diolefin or a mixture of aliphatic conjugated diolefin and vinyl compound using fatty acid soap, rosin soap or a mixture thereof as the emulsifier, in the presence of water-soluble alginate and water-soluble magnesium salt.

3,770,675

CURABLE EPOXIDIZED FATTY COMPOUND/POLYESTER COATING COMPOSITION

David D. Taft, Minneapolis, Minn., assignor to Ashland Oil, Inc., Ashland, Ky.

No Drawing. Filed Nov. 16, 1967, Ser. No. 683,734
The portion of the term of the patent subsequent to May 6, 1987, has been disclaimed
Int. Cl. C09d *3/64*
U.S. Cl. 260—22 EP **12 Claims**

Curable epoxidized fatty compound/polyester coating compositions which may, preferably, exist as a two package system prior to use, are improved as to pot

life and gloss, adhesion and toughness in the cured film by combining the polyester curing agent with a modified epoxy component such as a vinyl modified component.

3,770,676

POLYVINYL CHLORIDE MOLDING COMPOSITIONS CONTAINING COPOLYMER OF VINYL CHLORIDE AND FUMARIC ACID DIESTER FOR POLYMETHACRYLIC ACID ALKYL ESTER, PROCESS, AND ARTICLES

Harald Dörffurt, Hangelar, and Wolfgang Pungs, Troisdorf, Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

No Drawing. Filed Mar. 18, 1971, Ser. No. 125,826
Claims priority, application Germany, Mar. 19, 1970, P 20 13 031.8
Int. Cl. C08f *29/24*
U.S. Cl. 260—23 XA 11 Claims

Molding compositions amenable to blow molding, having high dimensional stability. The compositions comprise:

(a) tactic vinyl chloride polymerizate,
(b) a minor proportion of a copolymer of vinyl chloride and fumaric acid diester or polymethacrylic acid alkyl ester.

A preferred composition contains ester wax as lubricant.

3,770,677

ADHESIVE STICK

Thomas S. Mestetsky, Easton, Pa., assignor to GAF Corporation, New York, N.Y.

No Drawing. Filed Sept. 28, 1971, Ser. No. 184,617
Int. Cl. C08f *45/52*; C09j *3/26*
U.S. Cl. 260—28.5 R 9 Claims

There are disclosed herein novel adhesive sticks which contain from 20% to about 96% by weight of a wax, from about 4% to about 80% by weight of alkylated polyvinylpyrrolidone polymers which are waxy solids at room temperature and optional additives such as tackifiers, extenders, dyes, surfactants and anti-oxidants to obtain any combination of desired characteristics and function of the adhesive stick. The adhesive stick has particular application as adhesive for easy to bond substrates such as paper.

3,770,678

POLYSULFIDE LATEX BASED CAULKING COMPOSITIONS EXHIBITING IMPROVED PHYSICAL PROPERTIES

Henry N. Paul 3rd, Blue Bell, Pa., assignor to Thiokol Chemical Corporation, Bristol, Pa.

No Drawing. Filed Oct. 2, 1972, Ser. No. 294,395
Int. Cl. C08g *43/00, 51/30, 51/04*
U.S. Cl. 260—28 8 Claims

A polysulfide latex based caulking composition containing (a) a water dispersion of a solid polysulfide polymer having the structure $—(RS_x)_n—$, (b) from 3% to 15% by weight of total polymer solids of a thiol terminated liquid polysulfide polymer having the structure

$$HS—(RSS)_n—RSH$$

and (c) special purpose additives.

3,770,679

PROCESS FOR THE PREPARATION OF A POLY(VINYL ACETATE-DIALKYL MALEATE-ACRYLIC ACID) LATEX

Albert E. Corey, East Longmeadow, Donald D. Donermeyer, and Joel Fantl, Springfield, and Charles R. Williams, Longmeadow, Mass., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Dec. 16, 1970, Ser. No. 98,913
Int. Cl. C08f *1/13, 29/34*
U.S. Cl. 260—29.6 TA 16 Claims

Disclosed herein is a process for the preparation of a poly(vinyl acetate-di-lower alkyl maleate-acrylic acid) latex which comprises (1) interpolymerizing the monomers at a temperature of from 40 to 60° C. in a latex polymerization system using a surfactant system comprising a phosphate ester of an alkyl phenol-ethylene oxide condensate wherein the alkyl group contains 7 to 11 carbon atoms. The resulting latex has wide utility as a textile size.

3,770,680

AQUEOUS EMULSION OF INTERPOLYMER OF VINYL ACETATE, N-METHYLOL ACRYLAMIDE, AND ACRYLIC ACID

John G. Iacoviello, Somerville, N.J., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

No Drawing. Filed May 3, 1971, Ser. No. 139,828
Int. Cl. C08f *1/13, 29/42*
U.S. Cl. 260—29.6 TA 15 Claims

A grit-free, aqueous polymer emulsion, useful, for instance, as a base for a wood adhesive, is prepared by aqueous dispersion polymerization of vinyl acetate, N-methylol acrylamide, and acrylic acid in amounts sufficient to provide a thermosettable interpolymer containing about 5 to 20 weight percent of N-methylol acrylamide, about 1 to 3 weight percent of acrylic acid, and a balance consisting essentially of vinyl acetate.

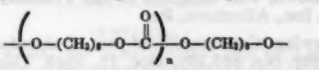
3,770,681

FIBROUS POLYURETHANE DISPERSIONS BY CHAIN EXTENSION OF POLYCARBONATE BASED PREPOLYMER WITH AQUEOUS POLYAMINE

Harro Witt, Hackenbroich, Gerhard Troemel, Pesch, and Gerhard Berndt, Monheim, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed July 14, 1971, Ser. No. 162,692
Claims priority, application Germany, July 18, 1970, P 20 35 730.6
Int. Cl. B32b *27/02*; D21h *5/12*
U.S. Cl. 260—29.2 TN 6 Claims

Aqueous suspensions or pastes of fibrous internally crosslinked particles are provided and a method for preparing them by reacting polyurethane or polyurethane urea prepolymers containing ionic groups, free NCO groups and from about 60% to about 90% by weight of hexane diol-1,6 polycarbonate segments having the structure



in which n is an integer of from 5 to 20 with aqueous solutions of polyamines containing at least three primary and/or secondary amino groups. Textile substitutes can be made from these materials.

3,770,682

EMULSIFICATION OF SULFONATED BUTYL RUBBER

Addison W. Hubbard, Scotch Plains, Kenneth W. Powers, Berkeley Heights, and Charles P. O'Farrell, Clark, N.J., assignors to Esso Research and Engineering Company

No Drawing. Filed Jan. 20, 1972, Ser. No. 219,496
Int. Cl. C08d *7/00, 7/10, 7/18*
U.S. Cl. 260—29.7 B 18 Claims

Sulfonated butyl rubber containing greater than 0.5 mole percent SO_3H is emulsified by dissolving the acid form of the polymer in a suitable solvent incorporating into the solvent rubber cement about 5 to 30 wt. percent of a polar cosolvent and using as emulsifiers nonionic emulsifiers at least one of which is an ethoxylated C_8–C_{12} alkyl phenol. In a preferred embodiment, at least one emulsifier is a water dispersible or water soluble emulsifier and is dispersed in the water into which the cement is to be dispersed.

The organic and polar solvents may be stripped from the emulsion along with excess water to form latices suitable for use as coatings and film formers.

3,770,683

GRAFT COPOLYMERS OF POLY(VINYLPYRROLIDONE) WITH ACRYLIC ACID AND ACRYLIC ESTER

Eugene S. Barabas, Watchung, and Marvin M. Fein, Westfield, N.J., assignors to GAF Corporation, New York, N.Y.

No Drawing. Continuation of abandoned application Ser. No. 25,255, Apr. 2, 1970. This application Feb. 14, 1972, Ser. No. 226,266

Int. Cl. C08f *19/00, 41/00*
U.S. Cl. 260—29.6 RW 8 Claims

Grafted terpolymers of a polymeric N-vinyl lactam, such as polyvinyl pyrrolidone, with alkyl acrylates and acrylic acid units, are prepared as stable aqueous solutions.

3,770,684

LATEX COMPOSITIONS CONTAINING BODYING AGENTS

William Singer, Teaneck, N.J., and Alfred E. Driscoll, Bronx, N.Y., assignors to Troy Chemical Corporation, Newark, N.J.

No Drawing. Filed June 25, 1970, Ser. No. 49,988

Int. Cl. C08f *29/36, 45/24*
U.S. Cl. 260—29.7 NR 8 Claims

Compounds of the type R—X— water soluble polymer —X—R' in which the water soluble polyether has a molecular weight between 3000 and 35,000, X is a connecting linkage and R and R' are water insoluble hydrocarbon residues each having a molecular weight of 220 to 400, such compounds being especially adapted for use as leveling agents and viscosity improvers in gloss and semi-gloss latex paints, and latex paint compositions containing same.

3,770,685

FUNCTIONAL SURFACE COATING COMPOSITIONS FOR CELLULOSIC MATERIAL

Melville W. Uffner, Media, and Dewey G. Holland, Allentown, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

No Drawing. Continuation-in-part of abandoned application Ser. No. 885,290, Dec. 15, 1969. This application Jan. 24, 1972, Ser. No. 220,443

Int. Cl. C08f *29/22, 37/18;* C08g *37/32*
U.S. Cl. 260—29.4 UA 19 Claims

Functional surface coating compositions, prepared by blending a mixture of a fluorine-containing polymer and a non-fluorine containing material in aqueous medium, impart solvent, grease and oil resistance to cellulosic materials.

3,770,686

BIS(3,4' - DICARBOXYPHENYL)SULFONE DIANHYDRIDE/METAPHENYLENE DIAMINE/OXYDIANILINE POLYIMIDE PRECURSOR

John A. Torelli, Long Island City, N.Y., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of application Ser. No. 54,018, July 10, 1970. This application June 1, 1971, Ser. No. 149,008

Int. Cl. C08g *20/32*
U.S. Cl. 260—30.2 6 Claims

A coating composition of a polyamic acid prepared from bis(3,4'-dicarboxyphenyl)sulfone dianhydride/metaphenylene diamine and optionally oxydianiline or methylene dianiline in butyrolactone or sulfolane or mixtures thereof which may be cured to a polyamide.

3,770,687

CONTROLLED RELEASE COATING COMPOSITION AND PROCESS

Thomas S. Mestetsky, Easton, Pa., assignor to GAF Corporation, New York, N.Y.

No Drawing. Filed July 27, 1971, Ser. No. 166,568

Int. Cl. C08f *35/02;* C08g *51/26*
U.S. Cl. 260—30.4 SB 8 Claims

A controlled release coating composition comprising an organic solvent solution of an organopolysiloxane and a solvent soluble polymer of a polymerizable unsaturated aliphatic dibasic acid or derivative thereof. Incremental changes in the proportion of said solvent soluble polymer lead to incremental changes in the release force of the coatings produced with such compositions. Processes for applying the new coating compositions are also described. A typical composition comprises a toluene solution of a polymethylsiloxane and a C_{18} alkyl vinyl ether/maleic anhydride copolymer in a 10:1 ratio on a weight basis.

3,770,688

COATING COMPOSITIONS AND PROCESS FOR THE PRODUCTION THEREOF

Karl Hamann, Leonberg, Walter Dittmann, Marl, Paul Sunder-Plassmann, Polsum, and Klaus Gorke, Hullern, Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

No Drawing. Filed Apr. 21, 1972, Ser. No. 246,134

Claims priority, application Germany, Apr. 23, 1971, P 21 19 783.1

Int. Cl. C08g *33/10*
U.S. Cl. 260—32.8 A 17 Claims

Coating compositions comprising a phenolic adduct of an unsaturated liquid polybutadiene wherein said adduct consists essentially of:

(a) 70–90% by weight of a liquid polybutadiene having, prior to the adduct formation, a viscosity of 200–5,000 cp. at 20° C., a molecular weight of 500–4,000 as determined by vapor pressure osmosis, an iodine number of 400–470 g. iodine/100 g., and double bonds which are 50–95% in the 1,4-cis-configuration; and
(b) 30–10% by weight of phenol, about 5–35% of which is joined to the polybutadiene as a phenyl ether and the remainder is joined thereto ortho- and para- to the phenolic hydroxy group;

said adduct containing 5–35% of the olefinic double bonds of the liquid polybutadiene.

3,770,689

PROCESS FOR THE ANIONIC CATALYTIC POLYMERIZATION OF LACTAMS

Josef L. M. van der Loos and Peter J. M. W. Claassen, Sittard, Netherlands, assignors to Stamicarbon N.V., Heerlen, Netherlands

No Drawing. Filed Jan. 21, 1971, Ser. No. 108,583

Claims priority, application Netherlands, Jan. 24, 1970, 7001021

Int. Cl. C08g *20/18*
U.S. Cl. 260—33.2 R 7 Claims

An improved process for the anionic, catalytic polymerization of lactams with the aid of one or more promoters is disclosed whereby a polyamide polymer having improved impact resistance is produced. The polymerization is carried out in the presence of a polyether with etherified OH groups and which is soluble in the molten lactam reaction mixture.

3,770,690

PRE-FABRICATED GEL COATS

Stanley Oswitch, University Heights, and Kevin K. Kipp, Cleveland Heights, Ohio, assignors to Ferro Corporation, Cleveland, Ohio

No Drawing. Continuation of abandoned application Ser. No. 43,213, June 3, 1970. This application Nov. 17, 1971, Ser. No. 199,752

Int. Cl. C08g *43/02, 51/04*

U.S. Cl. 260—37 EP 7 Claims

The pre-fabricated gel coating disclosed herein is easily handled, is in dry sheet form and can be preshaped and press molded. It comprises a layer of a uniform thickness of resin gel reinforced by a fiber mat such as polyethylene polyterephthalate fiber. The resin gel comprises an epoxy resin or an unsaturated polyester alkyd resin with fumed alumina filler. This pre-fabricated gel coating can be preshaped to fit molds having a moderate degree of configuration and thereafter molded simultaneously with the molding resin. This avoids the messiness and non-uniform thickness resulting from brushing or spray coating molds prior to molding. It also reduces the time required for the total molding operation.

3,770,691

CURABLE COMPOSITION COMPRISING CARBON FIBERS AND A MIXTURE OF ALIPHATICALLY UNSATURATED IMIDES

Joseph R. McLoughlin, Burnt Hills, N.Y., assignor to General Electric Company

No Drawing. Continuation of abandoned application Ser. No. 86,287, Nov. 2, 1970. This application Jan. 31, 1972, Ser. No. 222,334

Int. Cl. C08g *51/08, 51/10*

U.S. Cl. 260—37 N 3 Claims

A method is provided for making curable compositions in the form of carbon fiber prepregs or laminates using certain aliphatically unsaturated imides. The curable compositions can be converted by the use of heat and pressure to make high strength composites having a pre-determined shape.

3,770,692

COLORED POLYMERIC MICROSPHERE TONERS

Donald B. Miller, Menlo Park, Calif., assignor to Electroprint, Inc., Palo Alto, Calif.

No Drawing. Filed Oct. 29, 1971, Ser. No. 194,041

Int. Cl. C08f *45/66*

U.S. Cl. 260—41 C 14 Claims

Novel method for coloring small polymeric particles by dispersing the particles in an aqueous medium having a sufficient amount of a water miscible organic liquid capable of swelling the polymer and an oil soluble dye soluble in said organic liquid. By agitating the mixture, the dye is absorbed into the polymeric particles. The particles are then washed free of any unabsorbed dye and isolated.

3,770,693

STABILIZATION OF POLYESTERURETHANES WITH 2-IMINO-OXAZOLIDINES

Sidney H. Metzger, Pittsburgh, Pa., assignor to Baychem Corporation, New York, N.Y.

No Drawing. Original application Oct. 9, 1964, Ser. No. 402,951, now Patent No. 3,594,387. Divided and this application Dec. 1, 1970, Ser. No. 94,180

Int. Cl. C08g *51/60*

U.S. Cl. 260—45.8 NZ 4 Claims

This invention relates to the use of 2-imino-oxazolidines, for the stabilization of polyester urethane compositions against hydrolysis.

3,770,694

PROCESS FOR THE PRODUCTION OF NON-DISCOLORING, HEAT-STABLE AND DEGRADATION-RESISTANT POLYISOPRENES

Gerhard Berg and Karl-Heinz Nordsiek, Marl, Germany, assignors to Chemische Werke Huels Aktiengesellschaft, Marl, Germany

No Drawing. Filed June 16, 1972, Ser. No. 263,664

Claims priority, application Germany, June 18, 1971, P 21 30 118.8

Int. Cl. C08f *45/60*

U.S. Cl. 260—45.9 R 20 Claims

Polyisoprene having the high resistance to thermal and mechanical stresses of natural rubber is produced by incorporation into a solution of the polyisoprene a mixture of a difunctional secondary arylamine of the formula

wherein R_1 and R_2 are alkyl, cycloalkyl or aryl, and an aliphatic amine of the formula $R_n(NH)_{n-1}(NH_2)_x$ wherein x is 1 or 2, n is 1–10 and R is alkyl when n and x both are 1 and alkylene when n is greater than 1.

3,770,695

CARBANILIC ACID: o-FLUORO-, ALLYL ESTER

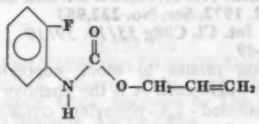
Richard A. Nyquist, Midland, and Thomas L. Reder, Bay City, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Sept. 3, 1971, Ser. No. 177,854

Int. Cl. C07c *125/06*

U.S. Cl. 260—47 C 1 Claim

A compound corresponding to the formula



that is, carbanilic acid: o-fluoro-, allyl ester. The preparation and utility of this compound in the control of internal parasites in animals is also disclosed.

3,770,696

CROSSLINKING OF AROMATIC POLYCARBONATES WITH ORGANIC POLYSULFONAZIDES

Edgar E. Bostick, Scotia, and Alfred R. Gilbert, Schenectady, N.Y. assignors to General Electric Company

No Drawing. Original application Nov. 14, 1969, Ser. No. 871,317, now Patent No. 3,583,939, which is a division of application Ser. No. 541,537, Apr. 11, 1966, now Patent No. 3,507,829. Divided and this application Jan. 27, 1971, Ser. No. 110,266

Int. Cl. C08g *17/13*

U.S. Cl. 260—47 XA 2 Claims

Aromatic polymers such as polycarbonates, polystyrene, phenylated organopolysiloxanes, and polyphenylene oxides are cross-linked by reaction with aromatic polysulfonazides.

3,770,697

CURABLE POLYCARBONATE COMPOSITIONS

Fred F. Holub and Milton L. Evans, Schenectady, N.Y., assignors to General Electric Company

No Drawing. Original application July 1, 1969, Ser. No. 838,306, now Patent No. 3,652,715. Divided and this application Apr. 30, 1971, Ser. No. 139,210

Int. Cl. C08g *17/13*

U.S. Cl. 260—47 XA 9 Claims

Polycarbonate compositions are provided comprising polycarbonates substituted with at least one chemically-combined aliphatically unsaturated imido radical, such as a maleimido radical. The imido-substituted polycarbonates can be blended with various aliphatically unsaturated

monomers, such as styrene, chlorostyrene, N-phenyl maleimide, diallylphthalate, triallylcyanurate, etc. and various organic polymers, such as polystyrene, polycarbonate, polysulfone, polyphenyleneoxide, polyurethane, etc. The polycarbonate, compositions of the present invention can be employed as molding compounds, for making films, laminates, etc.

3,770,698

PHENOL TERMINATED CARBOXY CONTAINING DIENE ELASTOMERS

Changkiu K. Riew, 2136 Stabler Road, Akron, Ohio 44313

No Drawing. Filed Dec. 17, 1971, Ser. No. 209,417
Int. Cl. C08d *5/02;* C08g *30/12*
U.S. Cl. 260—47 UP 9 Claims

Phenol terminated elastomers are prepared by reacting carboxyl terminated polymers of dienes with diphenols such as bisphenol A, so that the carboxyl groups become part of the molecular chain and phenolic hydroxyls become end groups. Very small proportions of the phenol terminated elastomers added to epoxy resin compositions such as those based on the diglycidyl ether of bisphenol A produce a very great increase in resistance to impact.

3,770,699

BIS(POLYPHENYLENE ETHER)-SULFONE BLOCK COPOLYMERS

Dwain M. White, 2334 St. Joseph Drive, Schenectady, N.Y. 12309

No Drawing. Original application Jan. 5, 1970, Ser. No. 817, now Patent No. 3,703,564. Divided and this application Feb. 2, 1972, Ser. No. 222,987
Int. Cl. C08g *33/10, 39/10*
U.S. Cl. 260—49 4 Claims

The invention relates to block copolymers of the A—B—A type where each A is the phenoxy residue of a poly(2,6-disubstituted - 1,4 - phenylene oxide) having one terminal hydroxyl per polymer molecule and B is the residue of a compound having two groups which are reactive with the hydroxyl group of said poly(phenylene oxide). These compositions are useful in producing molded articles, films, fibers, etc., having modified properties compared to the parent poly(phenylene oxides).

3,770,700

NOVEL CARBONYL POLYMERS

Peter Salvatore Forgione, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Aug. 24, 1971, Ser. No. 174,549
Int. Cl. C08f *3/40;* C08g *3/00*
U.S. Cl. 260—64 9 Claims

Carbonyl polymers cross-linked with dialdehydes, a method for their production and polymer bound catalytically active enzymes produced therefrom, are disclosed.

3,770,701

HETERIC NONIONIC SURFACTANTS HAVING ENHANCED DETERGENCY

Moses Cenker, Trenton, and Eugene A. Weipert, Allen Park, Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

No Drawing. Filed July 8, 1965, Ser. No. 470,622
Int. Cl. C07c *43/00, 43/04*
U.S. Cl. 260—65 B 6 Claims

This invention relates to liquid, biodegradable, water-miscible, nonionic surfactants. More particularly, this invention relates to liquid, biodegradable, water-miscible, nonionic surfactants having unexpectedly high detergency prepared from straight chain aliphatic alcohols having from 8 to 22 carbon atoms in the aliphatic chain and a mixture of ethylene oxide and propylene oxide.

3,770,702

COATING COMPOSITION

Robert Roper, Summit, and Charles A. Rowe, Jr., Westfield, N.J., assignors to Esso Research and Engineering Company

No Drawing. Continuation of application Ser. No. 2,929, Jan. 14, 1970. This application Dec. 9, 1970, Ser. No. 206,559
Int. Cl. C08f *29/50*
U.S. Cl. 260—73 R 11 Claims

A novel solventless coating composition is prepared characterized by its ready air-dryability to a tough, hard finish. The coating composition contains certain esters of di- or polyhydroxy alcohols and α,β-olefinically unsaturated carboxylic acids together with a polyfunctional aldehyde having less than all of its aldehyde groups acetalized.

3,770,703

HEAT HARDENABLE MIXTURES OF ϵ-CAPROLACTAM BLOCKED POLYISOCYANATES AND CYCLOALIPHATIC POLYAMINES

Hermann Gruber, Leverkusen, and Eberhard Degener, Opladen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed June 14, 1972, Ser. No. 262,915
Claims priority, application Germany, June 24, 1971, P 21 31 299.2
Int. Cl. C08g *22/32*
U.S. Cl. 260—77.5 TB 7 Claims

Heat cross-linkable compositions are provided which are a mixture of a cycloaliphatic polyamine and a ϵ-caprolactam blocked polyisocyanate compound. The compositions are suitable in the production of sheet structures and molded articles.

3,770,704

AROMATIC POLYAMIDES CONTAINING 4,4-DIAMINO-OXANILIDE MOIETIES

Frank Dobinson, Gulf Breeze, Fla., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Mar. 24, 1972, Ser. No. 237,944
Int. Cl. C08g *20/20*
U.S. Cl. 260—78 R 6 Claims

A class of film- and fiber-forming, aromatic polyamides prepared by the condensation of substantially equimolar amounts of a diamine reactant comprising 4,4'-diaminooxanilide and an aromatic diacid halide reactant. Fibers prepared from these polyamides are thermally stable and have a high modulus and are particularly suitable as reinforcing elements for rubber and plastic articles.

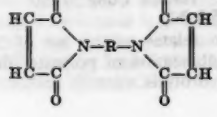
3,770,705

THERMOSETTING RESINS PREPARED FROM DIMALEIMIDES AND ISOCYANURIC ACID OR DERIVATIVE THEREOF

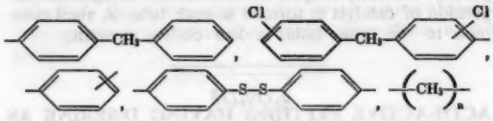
Keiiti Akiyama and Kiyoji Makino, Yokosuka, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

No Drawing. Filed June 9, 1972, Ser. No. 261,322
Claims priority, application Japan, July 14, 1971, 46/51,787; Sept. 23, 1971, 46/73,781
Int. Cl. C08g *20/32*
U.S. Cl. 260—78 UA 1 Claim

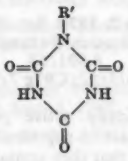
A heat-resistant thermosetting resin composition is formed by mixing and heating (a) 85 to 55% by mol of N,N'-substituted dimaleimide represented by the following general formula:



where R is



n is an integer of from 1 to 6; with (b) 15 to 45% by mol of an isocyanuric acid and/or derivative thereof represented by the following general formula:



where R' is H or a member selected from the group consisting of alkyl, and allyl. This resin composition is characterized by excellent heat resistance, resistance to cracking induced by heat-cycling, excellent mechanical strength and good bonding properties.

3,770,706

SURFACE SULFONATION-EPOXIDATION OF ORGANIC POLYMERS

Wilhelm E. Walles, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Sept. 13, 1971, Ser. No. 180,229
Int. Cl. B32b *27/16;* B44d *5/12*
U.S. Cl. 260—79.3 R 8 Claims

Organic polymers such as polyethylene, polystyrene and polypropylene are rendered adhesive, antistatic and highly impermeable to oleophilic materials and low molecular weight gases such as oxygen and carbon dioxide by initially surface sulfonating the organic polymer and subsequently reacting the substituent sulfonic acid groups with alkylene oxide or similar epoxide to form the corresponding ester of sulfonic acid.

3,770,707

NITROBENZOTHIAZOLE ALKYL OR CYCLOALKYL DISULFIDES

Kamel Boustany, John Joseph D'Amico, and Alfred Bay Sullivan, Akron, Ohio, assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Dec. 15, 1971, Ser. No. 208,408
Int. Cl. C08c *11/62;* C08f *27/06*
U.S. Cl. 260—79.5 B 6 Claims

This invention relates to new compounds which are useful as accelerators in the vulcanization of rubber. More particularly, it pertains to aliphatic nitrobenzothiazolyl disulfides which are classified in class 260–306 of the Patent Office.

3,770,708

PRESSURE SENSITIVE ADHESIVE COPOLYMER FORMED FROM VINYL MONOMER AND ZWITTERION MONOMER AND TAPES MADE THEREWITH

Hanspeter Knoepfel, Basel, Switzerland, and Spencer F. Silver, White Bear Lake, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Filed Dec. 2, 1970, Ser. No. 94,595
Int. Cl. C08f *15/00*
U.S. Cl. 260—80.73 8 Claims

Pressure-sensitive adhesives formed by copolymerizing (1) 80–99 weight percent monomer selected from the class of acrylates having 5–17 carbon atoms in the pendant chain, methacrylates having 8–17 carbon atoms in the pendant chain, or vinyl esters based on carboxylic acids containing 4–13 carbon atoms and (2) 1–20 weight percent of terminally-unsaturated zwitterion monomer possess excellent physical properties.

3,770,709

MONOMER RECOVERY IN POLYMERIZATION PROCESSES

Bruce R. Tegge, Madison, and Barry M. Rosenbaum, Morris Plains, N.J., assignors to Esso Research and Engineering Company

Filed Aug. 14, 1969, Ser. No. 850,029
Int. Cl. C08f *15/04, 15/40*
U.S. Cl. 260—80.78 10 Claims

In acordance with certain of its aspects, the novel method of this invention for recovering unreacted higher alpha-olefin from a liquid effluent exiting a polymerization reaction containing catalyst, unreacted ethylene, unreacted higher alpha-olefin, and a cement of ethylene-higher alpha-olefin copolymer in a liquid diluent-solvent wherein said higher alpha-olefin has a boiling point at least 50° C. below the boiling point of said diluent-solvent may comprise:

(a) withdrawing said liquid effluent from said polymerization reaction;
(b) directly flashing said liquid effluent thereby separating, as overhead, diluent-solvent and unreacted ethylene and unreacted higher alpha-olefin and, as bottoms, a concentrated polymer cement containing a minor portion of unreacted higher alpha-olefin;
(c) recovering said unreacted higher alpha-olefin; and
(d) recovering said concentrated polymer cement.

3,770,710

BULK POLYMERIZATION OF DIOLEFINS

Shingo Futamura, Munroe Falls, and Thomas Chester Bouton, Akron, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

No Drawing. Continuation-in-part of applications Ser. No. 860,005, Sept. 22, 1969, and Ser. No. 132,189, Apr. 7, 1971. This application Aug. 23, 1971, Ser. No. 174,120
Int. Cl. C08f *1/04, 19/08;* C08d *1/00*
U.S. Cl. 260—83.7 6 Claims

In a process for bulk polymerizing liquid diene monomer to high molecular weight rubbery polymers in a system employing controlled evaporation of monomer for regulating polymerization temperature, excessive foaming with consequent loss of control of the polymerization is avoided by maintaining the polymerization temperature at a relatively low level until the polymer concentration has exceeded that at which the temperature of excessive foaming in the system is at a minimum. The polymerization temperature is then increased for completing the polymerization.

3,770,711

ORIENTED STRUCTURES OF TETRAFLUOROETHYLENE/PERFLUORO (ALKYL VINYL ETHER) COPOLYMER

Martval John Hartig and John Edward Hansen, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Jan. 31, 1972, Ser. No. 222,330
Int. Cl. C08f *15/02, 47/22*
U.S. Cl. 260—87.5 A 7 Claims

Oriented structures of tetrafluoroethylene/perfluoro (alkyl vinyl ether) copolymers, in which the alkyl group contains from 1 to 5 carbon atoms and the copolymer contains from 1.0 to 7% by wt. of the ether monomer, exhibit unexpectedly high long-term load-bearing ability as well as other improved properties over similarly oriented structures of commercially available tetrafluoroethylene/hexafluoropropylene copolymer.

3,770,712

SLURRY PROCESS FOR PRODUCING STYRENE HOMOPOLYMERS AND BLOCK POLYMERS THEREOF USING ANIONIC CATALYSTS

Frederick C. Schwab, Metuchen, N.J., assignor to Mobil Oil Corporation

No Drawing. Filed May 12, 1971, Ser. No. 142,821
Int. Cl. C08f *1/09*
U.S. Cl. 260—93.5 10 Claims

There is provided a slurry process for the polymerization of a non-polar styrene monomer, using an anionic catalyst initiator, a praffinic or monolefinic hydrocarbon slurrying medium, using an AB or ABA block polymer as dispersant, wherein the A monomer is styrene and the B monomer is a substituted styrene whose homopolymer is glassy at room temperature. The process is characterized by fast reaction times and easy removal of high quality crystal polystyrene polymer, which polymer is not soluble in the slurrying medium. There is also provided the continuance of the initial slurry polymerization with a second monomer, polymerizable with anionic catalysts, to produce block polymers. In the case wherein the slurrying agent is a volatile hydrocarbon, the product obtained will contain absorbed slurrying medium and, thus, be a foamable product.

3,770,713

OLEFIN POLYMERIZATION

Robert P. Zelinski and James N. Short, Bartlesville, Okla., Rudolph H. Gath, Ludwigshafen, Germany, and Ernest A. Zuech, Bartlesville, Okla., assignors to Phillips Petroleum Company

No Drawing. Continuation of abandoned application Ser. No. 788,014, Dec. 30, 1968. This application Dec. 13, 1971, Ser. No. 207,572
The portion of the term of the patent subsequent to Jan. 25, 1989, has been disclaimed
Int. Cl. C08f *1/56, 3/08*
U.S. Cl. 260—93.7 6 Claims

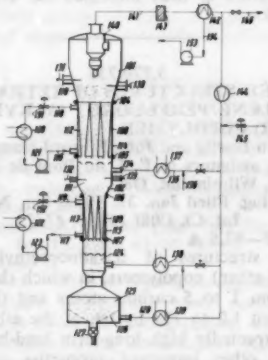
Non-crystalline polymers are prepared by contacting a 1-olefin with a catalyst composed of (a) an organoaluminum compound, (b) a vanadium oxyhalide, and (c) a reaction product of a molybdenum trihalodicarboxylate and nitric oxide.

3,770,714

POLYMERIZATION OF OLEFINS

Oskar Dorschner, Bad-Homburg von der Höhe, Hans-Werner Gross, Buchschlag, and Rainer Hartmann, Frankfurt am Main, Germany, assignors to Metallurgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed May 22, 1968, Ser. No. 731,186
Int. Cl. C08f *1/98, 3/04, 3/08*
U.S. Cl. 260—93.7 1 Claim



In a fluid bed reactor for the gas-phase polymerization of olefins, the incoming gas stream is separated into partial stream by being passed through a plurality of parallel conically shaped diffuser tubes. An agitated suspension of catalyst is formed in each tube. A shell common to the tubes holds a low boiling coolant.

3,770,715

ACTH-ACTIVE PEPTIDES HAVING D-SERINE AS FIRST AMINOACID FROM N-TERMINUS AND L-ORNITHINE AS 11-AMINOACID

Godefridus Ignatius Tesser, Nijmwegen, Netherlands, and Werner Rittel, Basel, Switzerland, assignors to Ciba-Geigy Corporation

Filed June 2, 1970, Ser. No. 42,886
Claims priority, application Switzerland, June 10, 1969, 8,801/69
Int. Cl. C07c *103/52;* C07g *7/00;* C08h *1/00*
U.S. Cl. 260—112.5 7 Claims

Adrenocorticotropically active peptides which differ from (all-L)-ACTH-active peptides having a sequence of 18–39 aminoacids in that they contain as the first aminoacid (from the N-terminus) D-serine and as aminoacid in the positions 11 or 11 and 15–16 or 11 and 15–18, L-ornithine, and their C-terminal amides and acid addition salts and complexes of these compounds.

3,770,716

2,4 - DISUBSTITUTED-5-IMINO-4,5-DIHYDRO-1,2,4-TRIAZOLIUM-3-YL AZO ANILINE OR NAPHTHYLAMINE DYESTUFFS

Minoru Ozutsumi, Kyokuji Arakawa, Masao Yamamoto, and Osamu Narukawa, Tokyo, Japan, assignors to Hodogaya Chemical Co., Ltd., Tokyo, Japan

No Drawing. Filed Jan. 19, 1971, Ser. No. 107,854
Claims priority, application Japan, Feb. 2, 1970, 45/8,450
Int. Cl. C09b *29/00, 43/00*
U.S. Cl. 260—146 R 8 Claims

Basic monoazo dyestuffs, corresponding to the formula:

$$[D—N=N—E]^{\oplus}X^{\ominus}$$

in which D is a 2,4-disubstituted-5-imino-4,5-dihydro-1,2,4-triazolium-3-yl radical, E is a residue of an aniline or naphthylamine coupling component and X is an anion, are particularly valuable for the coloration of acrylic, modacrylic and acid modified polyester textile materials. The disclosed compounds give red to violet dyeings having improved fastness to light on such textile materials.

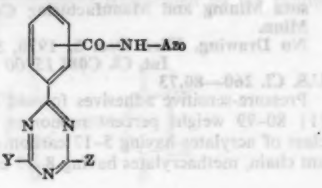
3,770,717

AZO DYES FROM CHLOROCARBONYL ARYL DICHLOROTRIAZINES

Asa W. Joyce, Millersville, Md., and Julian J. Leavitt, Plainfield, N.J., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Division of application Ser. No. 354,757, Mar. 25, 1964, now Patent No. 3,507,864, which is a continuation of application Ser. No. 125,942, July 24, 1961, now abandoned, which in turn is a division of application Ser. No. 781,871, Dec. 22, 1958, now Patent No. 3,055,895. This application Jan. 9, 1968, Ser. No. 696,497
Int. Cl. C09b *62/08*
U.S. Cl. 260—153 4 Claims

Azo dyes containing a carboxyphenyltriazine nucleus are provided having the formula



wherein Azo is the remainder of an aminoazo dye and Y and Z are chlorine, bromine, or the residue of an amino-azo dye, an amino-vat dye or an amino-phthalocyanine dye attached to the triazine through its amino group.

3,770,718

WATER-INSOLUBLE DISAZO DYESTUFFS FOR POLYESTER

Hans-Joerg Angliker and Richard Peter, Basel, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

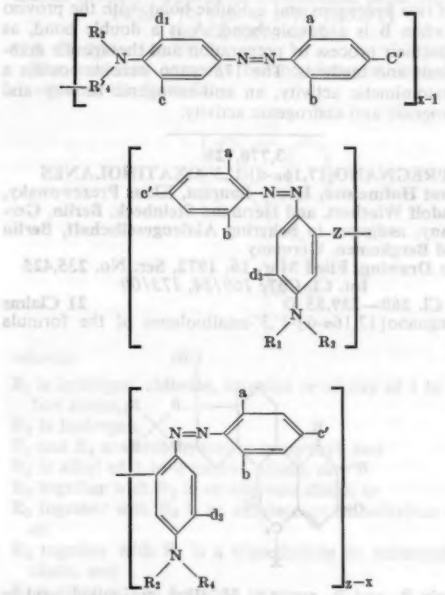
No Drawing. Continuation-in-part of application Ser. No. 716,267, Mar. 12, 1968. This application Feb. 10, 1971, Ser. No. 114,401

Claims priority, application Switzerland, Mar. 15, 1967, 3,756/67; Aug. 4, 1967, 11,011/67

Int. Cl. C09b *31/02, 33/02;* **D06p** *3/52*

U.S. Cl. 260—175 **6 Claims**

Water-insoluble disazo dyestuffs of the formula



in which, generally,

R_1, R_2, R_3 and R_4 are each hydrogen, alkyl or substituted alkyl,

R'_4 is alkylene,

x is 1 or 2,

each *a* independently is hydrogen, halogen, lower alkyl, lower alkoxy, nitro, cyano, carbo-lower alkoxy or lower alkylsulphonyl,

each *b* independently is hydrogen, halogen, lower alkyl, cyano or trifluoromethyl,

each *c'* independently is nitro, cyano, carbo-lower alkoxy or lower alkylsulphonyl, and

Z is a bridging group.

These dyestuffs are useful in dyeing synthetic fibers especially polyester fibers to give dyeings which posses excellent fastness properties with especially good fastness to light, sublimation, decatizing, washing and chlorinated water. Dyeings on secondary acetate rayon also give good fastness to gas fading. These dyestuffs also reserve wool and cotton well.

3,770,719

2-AMINO-4-(AZOYL)-AZO-THIAZOLE COMPOUNDS AND QUATERNARY DERIVATIVE THEREOF

John G. Fisher and Clarence A. Coates, Jr., Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Dec. 7, 1967, Ser. No. 688,687

Int. Cl. C09b *29/36;* **D06p** *3/52*

U.S. Cl. 260—158 **14 Claims**

Monoazo compounds containing a quaternized or unquaternized benzothiazolyl, thiazolyl, pyrazolyl, thiadiazolyl or triazolyl diazo component and a 2-amino-4-thiazolyl coupling component. The quaternary azo compounds are useful for dyeing acrylic, modacrylic and acid-modified polyester textile materials orange to blue shades and exhibit excellent fastness properties such as fastness to light and wet processing.

3,770,720

PROCESS FOR THE EXTRACTION OF ALKALI SALTS OF DEOXYRIBONUCLEIC ACID FROM ANIMAL ORGANS

Adriano Butti, Como, Giuseppe Prino, Milan, and Gianfranco Bertellini, Maslianico, Italy, assignors to Crinos Industria Farmacobiologica S.p.A., Villa Guardia, Italy

No Drawing. Filed Nov. 2, 1971, Ser. No. 194,919

Claims priority, application Italy, Nov. 3, 1970, 31,308/70

Int. Cl. C07d *51/50*

U.S. Cl. 260—211.5 R **3 Claims**

A process for extracting alkali salts of deoxyribonucleic acid (DNA) from animal organs wherein the comminuted animal organ, after a preliminary treatment, is reacted with an aqueous solution of a zinc salt forming the zinc salt of DNA which precipitates, the resulting precipitate is then separated and converted into the corresponding alkali salt.

3,770,721

DIRECT PRODUCTION OF BETA-HMX

Robert Robbins and Benjamin C. Boswell, Jr., Kingsport, Tenn., assignors to the United States of America as represented by the Secretary of the Army

Filed Feb. 9, 1956, Ser. No. 564,428

Int. Cl. C07d *55/60*

U.S. Cl. 260—239 HM **7 Claims**

1. The process for the direct production of beta-HMX which comprises substantially continuously feeding into a precharged nitrator zone raw materials comprising hexamine, nitric acid, ammonium nitrate and acetic anhydride, the hexamine being dissolved in acetic acid and the rate of feed of said hexamineacetic acid solution being substantially greater than the rate of feed of the acetic anhydride in said nitrator zone, vigorously agitating together the aforementioned materials and maintaining them under a temperature between 40–50° C. for at least 15 minutes until at least some nitration has occurred, withdrawing reaction product from the nitrator zone to a further zone wherein the withdrawn reaction products are further agitated and permitted to age at a temperature between 40–50° C., withdrawing at least a portion of these aged materials to a second nitrator zone wherein further quantities of nitric acid, acetic anhydride and ammonium nitrate are incorporated into the reaction, subjecting the materials in this second nitrator zone to vigorous agitation and maintaining the temperature between 40–50° C., withdrawing such reaction mixture from the second nitrator zone to a further zone wherein the withdrawn reaction products are further agitated and permitted to age at a temperature between 40–50° C. whereby a reaction mixture containing a substantial portion of beta-HMX is produced, withdrawing such reaction mixture to further treatment which includes hydrolysis, filtering, washing and drying for obtaining a crystalline beta-HMX product.

3,770,722

6 - [ALPHA - (ARYL SUBSTITUTED)ACYLAMINO-ACYLAMINO]PENICILLANIC ACIDS AND DERIVATIVES THEREOF

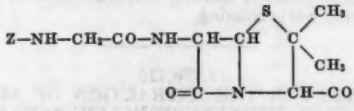
Gene M. Bright and Ernest S. Hamanaka, Groton, Conn., assignors to Pfizer Inc., New York, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 117,758, Feb. 22, 1971. This application Oct. 4, 1971, Ser. No. 186,413

Int. Cl. C07d *99/16*

U.S. Cl. 260—239.1 8 Claims

A novel series of antibacterial agents; namely, 6-[α-(aryl substituted)acylaminoacylamino]penicillanic acids of the formula



I

the non-toxic salts, esters and amides thereof wherein Z is $RR_1CH—CO—$; R is phenyl, substituted phenyl or thienyl; R_1 is hydrogen or COOH; and intermediates therefor of the above formula wherein Z is hydrogen.

3,770,723

PROCESS FOR PREPARING ISOMER OF 2-CHLORO-11 - (3 - DIMETHYLAMINOPROPYLIDENE) MORPHANTHRIDINE

Alexander E. Drukker, Milwaukee, Wis., assignor to Colgate-Palmolive Company, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 848,355, Aug. 7, 1969, now Patent No. 3,699,099, dated Oct. 17, 1972. This application Mar. 11, 1971, Ser. No. 123,374

Int. Cl. C07d *41/08*

U.S. Cl. 260—239 D 1 Claim

The compound 2-chloro-11-(3-dimethylaminopropylidene)morphanthridine exists as two different geometric isomers. One of the isomers is useful as an antihypertensive. A method of preparation of the compound which results in maximum yields of the antihypertensive geometric isomer substantially free from the other geometric isomer is described.

3,770,724

PROCESS FOR PREPARING PENTACYCLIC ALKALOIDS

Julien Warnant, Neuilly-sur-Seine, André Farcilli, Rosny-sous-Bois, and Edmond Toromanoff, Paris, France, assignors to Roussel-UCLAF, Paris, France

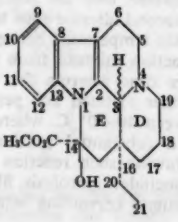
No Drawing. Filed Mar. 22, 1971, Ser. No. 126,929

Claims priority, application France, Mar. 31, 1970, 7011406; Sept. 10, 1970, 7032889

Int. Cl. C07d *99/02*

U.S. Cl. 260—239.3 P 10 Claims

Process for preparing pentacyclic alkaloids of general formula:



(I)

3,770,725

17β-CYANO-UNSATURATED STEROIDS, PROCESS AND THERAPEUTIC METHOD

Jean-Claude Gasc, Bondy, and Robert Bucourt, Paris, France, assignors to Roussel-UCLAF, Paris, France

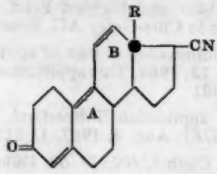
No Drawing. Filed May 31, 1972, Ser. No. 258,324

Claims priority, application France, June 1, 1971, 19,711

Int. Cl. C07c *169/22*

U.S. Cl. 260—239.5 17 Claims

17β-cyano steroids having the formula



wherein R is alkyl having 1 to 3 carbon atoms, A is selected from the group consisting of two hydrogens and a double bond and B is selected from the group consisting of two hydrogens and a double bond, with the proviso that when B is a double bond, A is a double bond, as well as their process of preparation and therapeutic compositions and methods. The 17β-cyano steroids possess a progestomimetic activity, an anti-estrogenic activity and an exogenic anti-androgenic activity.

3,770,726

PREGNANO[17,16α-d]-1',3'-OXATHIOLANES

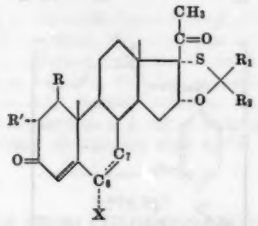
Helmut Hofmeister, Henry Laurent, Klaus Prezewowsky, Rudolf Wiechert, and Hermann Steinbeck, Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany

No Drawing. Filed Mar. 16, 1972, Ser. No. 235,425

Int. Cl. C07c *169/34, 173/00*

U.S. Cl. 260—239.55 D 21 Claims

Pregnano[17,16α-d]-1',3'-oxathiolanes of the formula



wherein R_1 and R_2 are, e.g., H, alkyl, cycloalkyl, aryl or heteroaryl, possess long acting progestional activity and are produced by the acid catalyzed condensation of the corresponding 16β-hydroxy-17α-mercapto steroids with a ketone or aldehyde under epimerization of the substituent on carbon atom C–16.

3,770,727

NOVEL BASIC PYRAZOLINE DYES

Alfred Brack, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

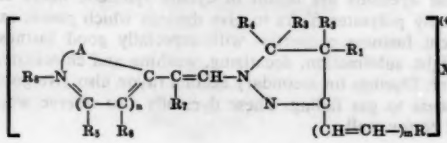
No Drawing. Filed Aug. 31, 1970, Ser. No. 68,485

Claims priority, application Germany, Sept. 5, 1969, P 19 45 053.4; July 23, 1970, P 20 36 505.3

Int. Cl. C09b *23/00*

U.S. Cl. 260—240.8 9 Claims

Basic dyestuffs of the general formula



in which A denotes the residual members of a heterocyclic 5- or 6-ring with which further rings may be fused; R means an aryl radical or a heterocyclic radical of aromatic character; R_1, R_2, R_3, R_4, R_5 and R_6, independently of one another, denote hydrogen or a non-ionic radical, preferably alkyl, cycloalkyl, aralkyl, or aryl radicals, and R_1 may be linked to R_2 or R_3 or R; R_7 means hydrogen or a nitrile group; R_8 is an alkyl, cycloalkyl, aralkyl or aryl radical, and R_8 may also be linked to any ring fused with A; $X^{(-)}$ means an anion; and *m* and *n*, independently of one another denote the numbers 0 or 1; and in which the carbocyclic and heterocyclic radicals and the acyclic hydrocarbon radicals contained in these formulae may carry nonionic substituents, as well as processes for the production thereof, and their use for dyeing and printing.

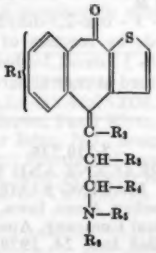
3,770,728

SUBSTITUTED 4H-BENZO[4,5]CYCLOHEPTA[1,2-b] THIOPHEN-10(9H)-ONES

Jean-Pierre Bourquin, Magden, Aargau, Gustav Schwarb, Allschwil, and Erwin Waldvogel, Aesch, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

No Drawing. Filed Sept. 7, 1971, Ser. No. 178,449
Claims priority, application Switzerland, Sept. 24, 1970, 14,120/70; Feb. 4, 1971, 1,632/71
Int. Cl. C07d *63/18*
U.S. Cl. 260—240 TC **12 Claims**

The invention concerns benzocycloheptathiophene derivatives of the formula:



wherein

R_1 is hydrogen, chlorine, bromine or alkoxy of 1 to 4 carbon atoms,
R_2 is hydrogen,
R_3 and R_4 are each hydrogen or methyl, and
R_5 is alkyl of 1 to 4 carbon atoms, or
R_5 together with R_2 is an ethylene chain, or
R_5 together with R_3 is an ethylene or trimethylene chain, or
R_5 together with R_4 is a trimethylene or tetramethylene chain, and
R_6 is alkyl of 1 to 4 carbon atoms,
or pharmaceutically acceptable acid addition salts thereof.

A novel process is provided for their production. The compounds are useful specific histaminolytics.

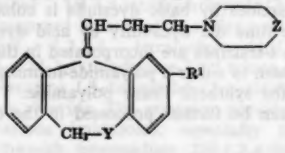
3,770,729

N-SUBSTITUTED PIPERIDINE COMPOUNDS

Michio Nakanishi, Oita, and Takanori Oe and Chiaki Tashiro, Yoshitomi-machi, Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

No Drawing. Filed Dec. 21, 1971, Ser. No. 210,592
Claims priority, application Japan, Dec. 22, 1970, 45/117,048; Dec. 25, 1970, 45/128,281; Dec. 28, 1970, 46/127,144
Int. Cl. C07d *29/28*
U.S. Cl. 260—240 TC **4 Claims**

N-substituted piperidine compounds of the formula

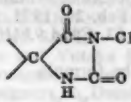


wherein Y is O, S or SO_2, R^1 is H, Cl, CH_3 or OCH_3 and Z is a bivalent group selected from the group consisting of

(1)

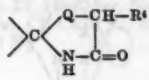
in which R^2 is OH, CN, $CONH_2$, $COOC_2H_5$ or $COCH_3$ and R^3 is dimethylamino, piperidino, morpholino, phenyl substituted phenyl (the substituent being Cl, CH_3 or CF_3) or acetylamino,

(2)



and

(3)



in which Q is O or S and R^4 is H, CH_3 or phenyl, and pharmaceutically acceptable acid addition salts thereof are useful as psychotropic agents for the treatment of schizophrenia, psychoneurosis, manic-depressive psychosis and the like.

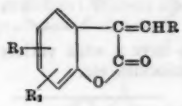
3,770,730

ELECTROPLATING OF NICKEL

Henry Brown, Huntington Woods, Mich., assignor to Oxy Metal Finishing Corporation, Warren, Mich.

No Drawing. Application Mar. 16, 1971, Ser. No. 124,941, now Patent No. 3,663,378, dated May 16, 1972, which is a continuation-in-part of abandoned application Ser. No. 812,377, Apr. 1, 1969. Divided and this application Feb. 4, 1972, Ser. No. 223,754
Int. Cl. C07d *5/40*
U.S. Cl. 260—240 F **7 Claims**

An aqueous acidic nickel plating bath which contains a brightening amount of a compound having the formula:



wherein R_1 and R_2 are H, CH_3, C_2H_5, F, Cl, Br, CH_3O—, C_2H_5O—, CH_3CO—, CH_3CONH—, $-(CH_2)_n-SO_3H$, $-O(CH_2)_n-SO_3H$, C_2H_5CO—, or C_2H_5CONH—. R is H, F, Cl or phenyl, and *n* is a number from 1 to 6 inclusive.

3,770,731

N-s-TRIAZINE PERFLUOROALKYLMONOCARBOXYLIC ACID ESTERS

Horst Jaeger, Bettingen, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

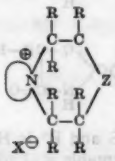
No Drawing. Original application Dec. 4, 1970, Ser. No. 95,340. Divided and this application Sept. 6, 1972, Ser. No. 286,796
Int. Cl. C07d *55/38*
U.S. Cl. 260—248 NS **10 Claims**

Perfluoroalkylmonocarboxylic acid esters from N-heterocyclic epoxides are provided. These esters contain a perfluoro alkyl radical, which is bonded directly or via an alkylene group with 1 to 10 carbon atoms to a carboxyl group. This carboxyl group is bonded in an ester-like manner to an acyclic, aliphatic radical substituted in the 2-position to the ester bridge by a free, etherified or esterified hydroxyl group. This letter radical being bonded to a ring nitrogen atom of a N-heterocyclic radical, which in turn at least by its second ring nitrogen atom is bonded to an acyclic aliphatic radical which contains an epoxide group in the terminal position or is linked to an-

aliphatic radical which is in turn bonded in an ester-like manner to a perfluoroalkyl radical. These fluoro compounds are manufactured from the corresponding perfluoroalkylcarboxylic acids and epoxides and are used for finishing of porous and non-porous substrates, especially for producing oleophobic finishes on textiles.

3,770,732
CYCLIC THIAZINES
Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, Wilmington, Del.
No Drawing. Filed Feb. 26, 1971, Ser. No. 119,387
Int. Cl. C07d *93/10*
U.S. Cl. 260—243 R **7 Claims**

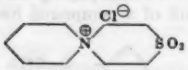
Cyclic thiazines of the formula



where the R's are hydrogen or a substituted group such as a hydrocarbon group, i.e., alkyl, etc. and

is a cyclic moiety, Z is

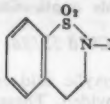
and X is an anion, are prepared by reacting a cyclic secondary amine salt with a divinyl sulfur compound. These are illustrated by the reaction of piperidine hydrochloride with divinyl sulfone to yield



These products have a wide variety of uses including their use as microbiocides, etc.

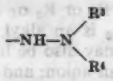
3,770,733
NOVEL THERAPEUTICALLY ACTIVE DIHYDROBENZOTHIAZINE-S-DIOXIDES AND PROCESSES FOR PREPARING THEM
Enrico Sianesi, Milan, Paulo Da Re, Pisa, and Ivo Setnikar and Elena Massarani, Milan, Italy, assignors to Recordati SA Chemical and Pharmaceutical Company, Lugano, Switzerland
No Drawing. Filed Aug. 30, 1971, Ser. No. 176,254
Int. Cl. C07d *93/02*
U.S. Cl. 260—243 R **4 Claims**

New, therapeutically active compounds having the formula



...presents a straight or branched chain alkylene ... to 3 carbon atoms, and R represents a ...rmula

... or different, each ...ed chain alkyl, alkenyl or alkynyl group having up to 4 carbon atoms, or a phenyl group, or R^1 and R^2 together with the nitrogen atom to which they are bonded form a morpholino, piperidino, pyrrolidino or 4-methyl-piperizino group, or R represents a group having the formula



wherein R^3 and R^4, which are the same or different, each represents hydrogen or a lower alkyl group, or a phenyl group, or together form an alkylidene group having 2 or 3 carbon atoms, and processes for preparing the said compounds.

3,770,734
3-OXO-2,3-DIHYDRO-1,4-BENZOXAZINE DERIVATIVES
Marcel Pesson, Paris, and Henri Techer, Avon, France, assignors to Laboratoire Roger Bellon, Neuilly-sur-Seine, France
No Drawing. Filed Feb. 4, 1970, Ser. No. 8,753
Claims priority, application France, June 2, 1969, 6902748
Int. Cl. C07d *87/48*
U.S. Cl. 260—244 R **8 Claims**

6 - aminoalkyl - 3 - oxo-2,3-dihydro-1,4-benzoxazines, which may be made by reaction of a secondary amine with a 6 - haloalkyl - 3 - oxo-2,3-dihydro-1,4-benzoxazine, and which may be used as central nervous depressants.

3,770,735
FERROIN REAGENT AND METHOD OF MAKING SAME
Lawrence L. Stookey, Ames, Iowa, assignor to Hach Chemical Company, Ames, Iowa
No Drawing. Filed June 24, 1970, Ser. No. 49,579
Int. Cl. C07d *55/10*
U.S. Cl. 260—248 AS **13 Claims**

3-(2-pyridyl)-5,6-bis(phenylsulfonic acid) - 1,2,4 - triazine and certain salts thereof, e.g.-sodium, are provided together with a method for forming such compounds. These compounds are useful as reagents in the spectrophotometric determination of iron in water or other solutions.

3,770,736
SUBSTITUTED-s-TRIAZINES
Humio Kobayashi and Hiroshi Sakata, Kyoto, Takesi Mizoguti, Hirakata, Akio Sasaki, Uji, and Isuyoshi Nakamura, Kyoto, Japan, assignors to Unitika Kabushiki Kaisha, Amagasaki, Japan
No Drawing. Application July 2, 1970, Ser. No. 52,061, which is a continuation-in-part of abandoned application Ser. No. 718,263, Apr. 2, 1968. Divided and this application Aug. 24, 1971, Ser. No. 174,528
Claims priority, application Japan, Apr. 11, 1967, 42/22,566; Sept. 16, 1967, 42/59,306, 42/59,307, 42/59,308; Sept. 18, 1969, 42/59,696, 42/59,697; Dec. 15, 1967, 42/80,363; Jan. 11, 1968, 43/1,491
Int. Cl. C07d *55/12, 55/18, 55/20*
U.S. Cl. 260—249.8 **12 Claims**

Novel 2,4,6-trisubstituted-s-triazine derivatives containing sulfonate groups are used to improve the dyeability of synthetic linear polyamides, whereby the dyeability of the polyamides by basic dyestuffs is enhanced, while at the same time the dyeability by acid dyestuffs is inhibited. The s-triazines are incorporated in the polyamide by adding them to either a polyamide-forming reactant or directly to the synthetic linear polyamide. The modified polyamide can be further processed in the conventional manner.

3,770,737

PYRAZINE DERIVATIVES

Lewis A. Walter, Madison, N.J., assignor to Schering Corporation, Bloomfield, N.J.

No Drawing. Continuation of application Ser. No. 704,263, Feb. 9, 1968. This application Jur 24, 1970, Ser. No. 49,578

Int. Cl. C07d *51/18, 51/76*

U.S. Cl. 260—250 R 4 Claims

The present 2-substituted imidazolines and 2-substituted-3,4,5,6 - tetrahydropyrimidines possess valuable anti-depressant and anti-inflammatory properties. The compounds are prepared by the condensation of an appropriately substituted nitrile with a diamine. For example, condensation of 2-pyridylbenzyl cyanide with 1,2-ethylene diamine or with 1,3-propylene diamine produces a 2-(2-pyridylbenzyl) imidazoline or a 2-(2-pyridylbenzyl)-3,4,5,6-tetrahydropyrimidine.

3,770,738

HYDRAZIDES

Colin Elliott Marks, Quorn, and Michael Arthur Smith, Loughborough, England, assignors to Fisons Limited, Suffolk, England

No Drawing. Filed Feb. 8, 1971, Ser. No. 113,770

Int. Cl. C07d *51/04*

U.S. Cl. 260—250 A 9 Claims

Cyclic carboxylic acid hydrazides are produced by reacting an azine with a dicarboxylic acid or the anhydride thereof.

3,770,739

CYCLOPROPYL-1,2,4-OXADIAZOLYLPYRAZINES

William Joseph Fanshawe, Pearl River, N.Y., and Sidney Robert Safir, River Edge, N.J., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Sept. 11, 1972, Ser. No. 288,219

Int. Cl. C07d *51/76*

U.S. Cl. 260—250 3 Claims

Preparation of 1,2,4-oxadiazolylpyrazines by the reaction of cyclopropylcarboxylic acid anhydride and a pyrazine carboxamidoxime at an elevated temperature. Other methods are also described. The compounds are useful for their central nervous system depressant activity.

3,770,740

3-ALKYL-4-BIS-(2 - HYDROXYETHYL)AMINO-6-(5-NITRO-2-FURYL)-ISOXAZOLO[5,4-d]PYRIMIDINES

Homer Albert Burch, Norwich, N.Y., assignor to Morton-Norwich Products, Inc.

No Drawing. Filed May 16, 1972, Ser. No. 253,852

Int. Cl. C07d *51/46*

U.S. Cl. 260—256.4 F 3 Claims

3 - alkyl - 4 - bis(2 - hydroxyethyl)amino - 6 - (5 - nitro - 2 - furyl)isoxazolo[5,4 - d]pyrimidines are useful antibacterial agents.

3,770,741

1,3-DIMETHYL - 1,2,3,4 - TETRAHYDROHETERO-CYCLO[x,y-f]PURINE-2,4-DIONES AND METHOD FOR THEIR PREPARATION

Irving M. Goldman, Niantic, Conn., assignor to Pfizer Inc., New York, N.Y.

No Drawing. Original application Jan. 5, 1968, Ser. No. 695,861, now Patent No. 3,637,684. Divided and this application Aug. 11, 1971, Ser. No. 170,997

Int. Cl. C07d *57/48, 55/10, 55/12*

U.S. Cl. 260—256 11 Claims

1,3 - dimethyl - 1,2,3,4-tetrahydropyrido[2,1-f]purine-2,4-dione is prepared by extruding sulfur monoxide from 1,3 - dimethyl - 1,2,3,4 - tetrahydropyrido[1,2-b]-6-H-pyrimido[4,5-e][1,2,4]thiadiazine-2,4,5-trione, which is prepared by treating 1,3-dimethyl-6-(2-pyridylamino)uracil with thiony chloride. The extrusion provides a general route to various imidazoles, especially heterocycloimidazoles, through intermediate 2H-1,2,4-thiadiazine-1-oxides which can be prepared from N-vinylamidines. An alternative route is heating 1,3-dimethyl-5-halo-6-(2-pyridylamino)uracil. Novel 1,3-dimethyl-1,2,3,4-tetrahydroheterocyclo[x,y-f]purine-2,4-diones are useful for a variety of biological and chemotherapeutic purposes.

3,770,742

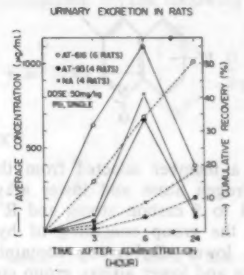
2-(SUBSTITUTED PYRROLIDINO) - 8-LOWER ALKYL - 5,8-DIHYDRO - 5-OXOPYRIDO[2,3-d] PYRIMIDINE-6-CARBOXYLIC ACID DERIVATIVES, AND PROCESS FOR THE PREPARATION OF THE SAME

Jun-Ichi Matsumoto and Yutaka Sekine, Osaka, Yoshiyuki Takase, Amagasaki, and Shinichi Nakamura, Osaka, Japan, assignors to Dainippon Pharmaceutical Co., Ltd., Higashi-ku, Osaka-fu, Japan

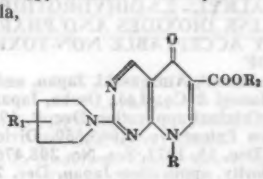
Filed Aug. 24, 1971, Ser. No. 174,431

Int. Cl. C07d *51/46*

U.S. Cl. 260—256.4 F 8 Claims



2-(substituted pyrrolidino)-8-lower alkyl-5,8-dihydro-5-oxopyrido[2,3-d]pyrimidine-6-carboxylic acid derivatives of the formula,



wherein

R_1 represents a hydroxyl, formyloxy, lower alkanoyloxy, benzoyloxy, or lower alkylsulfonyloxy group, group,

R represents a lower alkyl group, and

R_2 represents a hydrogen atom or a lower alkyl group.

The derivatives exhibit anti-bacterial activity against gram positive and gram negative bacteria An exemplary derivative is 2-(3-hydroxypyrrolidino)-2-ethyl-5,8 - dihydro-5-oxopyrido[2,3-d]pyrimidine-6-carboxylic acid.

3,770,743

1-(1,3-DIOXOLAN-4-YL-ALKYL)-PIPERAZINES AND PIPERAZINE ALKANE DIOLS

Waldo Richard Hardie, Walnut Creek, and Donald L. Tankersley, Oakland, Calif., assignors to Cutter Laboratories, Inc., Berkeley, Calif.

No Drawing. Filed Mar. 8, 1971, Ser. No. 122,144

Int. Cl. C07d *51/70*

U.S. Cl. 260—268 PH 24 Claims

1-(2-R_1,2-R_2-1,3-dioxolan-4-yl-alkyl)-4 - phenyl piperazines wherein alkyl contains 1–8 carbon atoms and R_1 and R_2 each are a hydrogen atom, alkyl, cycloalkyl or

phenyl or, collectively are alkylene, have pharmacological activity, including blood pressure-lowering activity, also analgesic and alpha adrenergic blocking activity.

3,770,744

2-LOWER ALKYL - 2,3-DIHYDROTHIENO[3,2-c] QUINOLINE N-OXIDES AND PHARMACEUTICALLY ACCEPTABLE NON-TOXIC SALTS THEREOF

Yasuo Makisumi, Amagasaki, Japan, assignor to Shionogi & Co., Ltd., Osaka, Japan

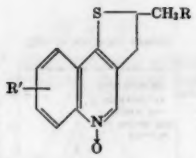
No Drawing. Original application Dec. 9, 1969, Ser. No. 883,613, now Patent No. 3,663,550. Divided and this application Dec. 15, 1971, Ser. No. 208,475

Claims priority, application Japan, Dec. 25, 1968, 43/95,190; Dec. 28, 1969, 45/296, 45/297

Int. Cl. C07d *63/18*

U.S. Cl. 260—283 S **6 Claims**

Compounds having the formula



wherein R is a member selected from the group consisting of hydrogen atom and lower alkyl group containing from 1 to 5 carbon atoms and R′ is a member selected from the group consisting of hydrogen atom, halogen atom, lower alkyl group containing from 1 to 5 carbon atoms and lower alkoxy group containing from 1 to 4 carbon atoms, show strong, hypothermic, analgesic and anti-inflammatory activities with low toxicities.

3,770,745

2-LOWER ALKYL - 2,3-DIHYDROTHIENO[3,2-c] QUINOLINE DIOXIDES AND PHARMACEUTICALLY ACCEPTABLE NON-TOXIC SALTS THEREOF

Yasuo Makisumi, Amagasaki, Japan, assignor to Shionogi & Co., Ltd., Osaka, Japan

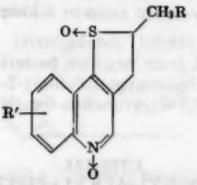
No Drawing. Original application Dec. 9, 1969, Ser. No. 883,613, now Patent No. 3,663,550. Divided and this application Dec. 15, 1971, Ser. No. 208,476

Claims priority, application Japan, Dec. 25, 1968, 43/95,190; Dec. 28, 1969, 45/296, 45/297

Int. Cl. C07d *63/18*

U.S. Cl. 260—283 S **5 Claims**

Compounds having the formula



wherein R is a member selected from the group consisting of hydrogen atom and lower alkyl group containing from 1 to 5 carbon atoms and R′ is a member selected from the group consisting of hydrogen atom, halogen atom, lower alkyl group containing from 1 to 5 carbon atoms and lower alkoxy group containing from 1 to 4 carbon atoms, show strong, hypothermic, analgesic and anti-inflammatory activities with low toxicities.

3,770,746

3′-HYDROXYQUINOPHTHALONE-5-CARBOXANILIDE

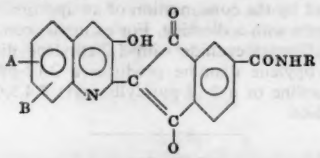
John Blackwell, Kennett Square, Pa., and Richard A. Fenoglio, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Dec. 2, 1970, Ser. No. 94,524

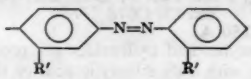
Int. Cl. C07d *33/46*

U.S. Cl. 260—289 QP **2 Claims**

Yellow, water insoluble quinophthalone dyes, useful for dyeing cotton or synthetic fibers or blends or mixtures thereof, having the formula



wherein A and B are the same or different and are selected from H, C_{1-4} alkyl, Cl or Br or A and B together are —C=C—C=C—, and R is o-, m- or p-(C_{8-18} alkyl)phenyl, o-, m- or p-(C_{4-12}alkoxy)carbonylphenyl or



wherein R′ is H or C_{1-4} alkyl.

3,770,747

ALKYLTHIO AND PHENYLTHIO CYCLOPROPYLAMINES FROM THE REACTION OF CHLOROMETHYL SULFIDES WITH ENAMINES

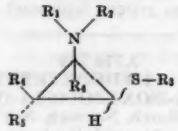
Ronald H. Rynbrandt, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Filed Nov. 1, 1971, Ser. No. 194,691

Int. Cl. C07d *29/36*

U.S. Cl. 260—293.73 **10 Claims**

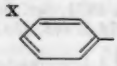
A compound selected from the group consisting of cis and trans aminocyclopropyl sulfides of the Formula II below:



(II)

wherein R_1 and R_2 are selected from the group consisting of alkyl of 1 to 3 carbon atoms, inclusive, cycloalkyl of 5 to 7 carbon atoms, inclusive, or together the group

is a heterocyclic amino radical selected from the group consisting of pyrrolidino, piperidino, methyl-substituted piperidino, morpholino, 4 - methylpiperazino, and hexamethyleneimino; wherein R_3 is alkyl defined as above, cycloalkyl as defined above, phenyl, or substituted phenyl of the formula



wherein X is selected from the group consisting of alkoxy of 1 to 3 carbon atoms, inclusive, alkyl defined as above, iodine, bromine, chlorine, and fluorine and —CF_3; wherein R_4 is selected from the group consisting of hydrogen and alkyl as defined above; with the proviso that R_4 is always hydrogen when R_5 and R_6 together form a cycloalkyl ring; wherein R_5 is selected from the group of

alkyl defined above, or wherein together R_4 and R_5 form a cycloalkyl ring of 5 to 7 carbon atoms; wherein R_6 is hydrogen or wherein together R_5 and R_6 are alkylene groups of 3 to 5 carbon atoms, inclusive, are prepared by a base catalyzed addition reaction of a selected chloromethyl sulfide to a compound containing an enamine moiety.

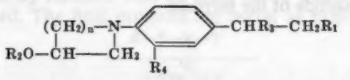
The invention also comprises the sulfoxides of II, the quaternary alkyl iodides and bromides (alkyl is 1 to 3 carbon atoms, inclusive,) and the pharmacologically acceptable acid addition salts of II or the sulfoxides of II. These compounds are useful as sedatives and tranquilizers.

3,770,748
SUBSTITUTED PHENYLALKANOL DERIVATIVES

Joachim Borck, Johann Dahm, Jan Willem Hovy, Josef Kramer, and Albrecht Wild, Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

No Drawing. Filed Mar. 24, 1972, Ser. No. 237,879
Claims priority, application Germany, Mar. 25, 1971, P 21 14 420.7
Int. Cl. C07d *29/24*
U.S. Cl. 260—293.81 **21 Claims**

Phenylalkanol derivatives of the formula



wherein R_1 is OH, alkoxy of up to 6 carbon atoms, cycloalkoxy of up to 6 carbon atoms, aryloxy of 6–12 carbon atoms, aralkoxy of 7–12 carbon atoms, or acyloxy of up to 18, preferably up to 6, carbon atoms; R_2 is H, alkyl of up to 6 carbon atoms, cycloalkyl of up to 6 carbon atoms, aryl of 6–12 carbon atoms, aralkyl of 7–12 carbon atoms, or acyl of up to 18, preferably up to 6, carbon atoms; R_3 is H or CH_3; R_4 is Cl, Br or CH_3; and n is 2 or 3; and the physiologically acceptable acid addition salts and quaternary ammonium salts thereof; possess useful pharmacological activity, including antiphlogistic, analgesic and antipyretic effects.

3,770,749
3-PYRIDYL-1,2,4-THIADIAZOLE-5-CARBOXAMIDES

Wendell Gary Phillips, Olivette, Mo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed July 1, 1971, Ser. No. 158,995
Int. Cl. C07d *99/10*
U.S. Cl. 260—294.8 D **3 Claims**

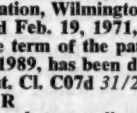
3,5-substituted-1,2,4-thiadiazoles are produced by the reaction of organic amidine hydrochlorides and sulfenyl chlorides in the presence of a base. These 3,5-substituted-1,2,4-thiadiazoles are useful as herbicides.

3,770,750
QUATERNARY FULL NITROGEN-HETEROCYCLIC PHOSPHONATES

Derek Redmore, Ballwin, Mo., assignor to Petrolite Corporation, Wilmington, Del.

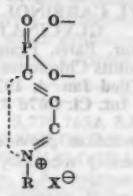
No Drawing. Filed Feb. 19, 1971, Ser. No. 117,082
The portion of the term of the patent subsequent to June 27, 1989, has been disclaimed
Int. Cl. C07d *31/28*
U.S. Cl. 260—294.8 R **7 Claims**

Quaternary nitrogen-heterocyclic phosphonates wherein the phosphonate group is ortho- or para- to the nitrogen heterocyclic group, where the compounds are characterized as follows:



(ortho substituted)

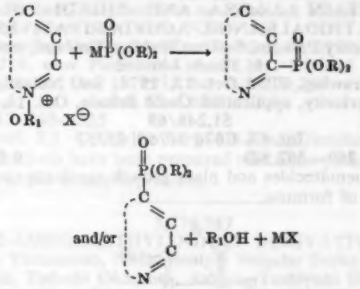
and



(para substituted)

wherein the dotted line represents a cyclic structure which cyclic structure may be the sole cyclic structure, or may be attached to other cyclic groups, where R is a hydrocarbon or a substituted hydrocarbon group such as alkyl, aryl, alkaryl, aralkyl, etc., and X is an anion such as halogen, a sulfite, a sulfate, a sulfonate-containing group, etc.

These nitrogen-heterocyclic phosphonates are prepared by reacting an aromatic nitrogen-heterocyclic compound, wherein the nitrogen atom is in the form of a quaternary alkoxy derivative (N—OR hereinafter defined) with a phosphite salt, preferably in the form of an ester of the phosphite, as exemplified by the following equation:



Quaternaries of these compounds are prepared by further reaction with a quaternizing agent.

These compounds which may be characterized as quaternaries of phosphonates of nitrogen-heterocyclics have many uses including their use as biocides, such as bacteriocides, herbicides, corrosion inhibitors, chelating agents, etc.

3,770,751
PROCESS FOR PREPARING NITRO SUBSTITUTED PICOLINONITRILES

Paul L. Anderson, Center Grove Road, Dover, N.J. 07801

No Drawing. Filed Dec. 13, 1971, Ser. No. 207,558
Int. Cl. C07d *31/46*
U.S. Cl. 260—294.9 **3 Claims**

Nitro substituted picolinonitriles, in particular 3-nitropicolinonitrile, have been found to be useful as anti-microbial agents.

3,770,752
PROCESS FOR PRODUCING N^1-ACYLATED PHENYLHYDRAZONE COMPOUNDS

Hisao Yamamoto, Nishinomiya, and Masaru Nakao, Osaka, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

No Drawing. Application June 23, 1969, Ser. No. 838,037, now Patent No. 3,629,284, which is a continuation of abandoned application Ser. No. 541,967, Apr. 12, 1966. Divided and this application July 29, 1970, Ser. No. 64,842
Claims priority, application Japan, Apr. 26, 1965, 40/24,928; Dec. 8, 1965, 40/75,793; Jan. 31, 1966, 41/5,754
Int. Cl. C07c *103/30;* **C07d** *31/44, 63/16*
U.S. Cl. 260—295.5 H **6 Claims**

1. Acetaldehyde N^1-(p-methoxyphenyl)-N^1-(chlorobenzoyl hydrazine.

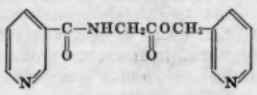
3,770,753

β-PYRIDYL CARBINOL NICOTINOYL GLYCINATE

Albert H. Beaufour, Paris, France, assignor to Societe d'Etudes de Produits Chimiques, Moulineaux, France

No Drawing. Filed Jan. 4, 1972, Ser. No. 215,428
Int. Cl. C07d 31/36
U.S. Cl. 260—295.5 A 1 Claim

The present invention provides the new compound (beta-pyridyl carbinol) nicotinoyl glycinate, which has the formula:



This compound is to be used in drugs for the treatment of cerebral arteriosclerosis and of any form of arteriopathies.

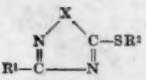
3,770,754

CERTAIN 1,2,4-OXA- AND -THIADIAZOL-5-YLTHIOALKANOIC ACID DERIVATIVES

John Henry Parsons, Saffron Walden, England, assignor to Fisons Limited

No Drawing. Filed Oct. 12, 1970, Ser. No. 80,165
Claims priority, application Great Britain, Oct. 18, 1969, 51,248/69
Int. Cl. C07d 91/60, 85/52
U.S. Cl. 260—302 SD 9 Claims

New nematocides and plant growth regulants comprise diazoles of formula,



in which R^1 is alkyl, substituted alkyl, aryl, or substituted aryl, R^2 is alkyl, alkenyl, alkynyl or substituted alkyl and X is oxygen or sulphur.

3,770,755

4-(4-BROMOPHENYL)-2-(2-HYDROXYISOPROPYL) THIAZOLE

Jonathan Hutton and Gilbert Joseph Stacey, Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Original application Sept. 9, 1968, Ser. No. 758,581, now Patent No. 3,652,575. Divided and this application Sept. 7, 1971, Ser. No. 178,424
Int. Cl. C08d 91/32
U.S. Cl. 260—302 R 1 Claim

This invention relates to new heterocyclic compounds, and more particularly to new phenyl-heterocyclic-alkanol derivatives, which have anti-inflammatory, analgesic and antipyretic activity.

3,770,756

DIMETHYL 1,2,5-THIADIAZOL-3-YL PHOSPHATE

James Billet, Rochester, N.Y., and Stanley T. D. Gough, Branchburg, N.J., assignors to Mobil Oil Corporation

No Drawing. Continuation-in-part of abandoned application Ser. No. 813,270, Apr. 3, 1969. This application Apr. 14, 1972, Ser. No. 244,262
Int. Cl. C07d 91/68
U.S. Cl. 260—302 E 1 Claim

Phosphate, phosphorothionate, phosphonate, and phosphonothionate esters of 3-hydroxy-1,2,5-thiadiazole and its substituted derivatives are provided, specifically dimethyl 1,2,5-thiadiazolyl phosphate. The latter compound has insecticidal and fungicidal activity.

3,770,757

DYES AND PHOTOGRAPHIC MATERIALS

Gene L. Oliver, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Original application Nov. 4, 1968, Ser. No. 773,291, now Patent No. 3,652,284, dated Mar. 28, 1972. Divided and this application Dec. 11, 1970, Ser. No. 97,289
Int. Cl. C09b 23/00
U.S. Cl. 260—304 11 Claims

Novel methine dyes are provided which feature a bis (alkylsulfonyl)allylidene (or -pentadienylidene) group or a diaryloxysulfonyl allylidene (or -pentadienylidene) group. The dyes are useful as filter dyes in photographic materials. Certain dyes of the invention function as spectral sensitizers for photographic silver halide emulsions.

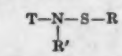
3,770,758

N-AZOLYL SULFENAMIDES

Joseph Edward Kerwood, Akron, Ohio, assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Continuation-in-part of application Ser. No. 861,152, Sept. 25, 1969, now Patent No. 3,645,987, dated Feb. 29, 1972. This application Oct. 14, 1971, Ser. No. 189,133
Int. Cl. C07d 91/46
U.S. Cl. 260—305 11 Claims

Sulfenamide of the formula



wherein R is alkyl, cycloalkyl, aralkyl, aryl or substituted aryl, where the substituents are alkyl, alkoxy, nitro, chloro, bromo, fluoro, iodo or hydroxy, R′ is hydrogen, lower alkyl, cycloalkyl, or R″S— where R″ has the same meaning as R and may be the same or different from R, T is azolyl or substituted azolyl selected from the group of thiazolyl, benzothiazolyl, benzoxazolyl, and substituted derivatives thereof, where the substituents are lower alkyl, chloro, bromo, fluoro, iodo, nitro or lower alkoxy are premature vulcanization inhibitors of vulcanizable elastomers.

3,770,759

PRODUCTION OF 2-MERCAPTOBENZTHIAZOLE

Bernhard Scherhag, Hermann Wolz, and Adolf von Friedrich, Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 5, 1970, Ser. No. 61,047
Claims priority, application Germany, Aug. 14, 1969, P 19 41 379.7
Int. Cl. C07d 91/48
U.S. Cl. 260—306 4 Claims

Recovering high purity product in high yield from a crude melt of aniline, sulphur and carbon disulphide by dissolving the hot melt in a solvent, extracting resulting solution with dilute aqueous alkali metal hydroxide and precipitation of product by acidification.

3,770,760

PROCESS FOR THE PREPARATION OF 2-AMINO-5-(5-NITROIMIDAZOL-2-YL)-1,3,4-THIADIAZOLES

William Henry Gastrock, Hightstown, N.J., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Original application Oct. 8, 1969, Ser. No. 864,861, now Patent No. 3,634,447. Divided and this application July 29, 1971, Ser. No. 167,492
Int. Cl. C07d 99/10
U.S. Cl. 260—306.8 D 5 Claims

This invention relates to methods for the preparation of novel 1 - benzoyloximino-1-(1-substituted-5-nitro-2-imidazolyl)-2-phenylglyoxals and the use of such compounds as intermediates in the preparation of antibacterial and antiprotozoal 2-amino-5-(5-nitro-1-substituted-2-imidazolyl)-1,3,4-thiadiazoles.

3,770,761

N-(SULFONYLCARBAMOYL)-BORNANO-[3',2':4,5]-OXAZOLIDIN-3-ONES

Hermann Bretschneider, Innsbruck, Klaus Grassmayr, Sistrans, near Innsbruck, and Kraft Hohenlohe-Oehringen, Innsbruck, Austria, and André Grüssner, Basel, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

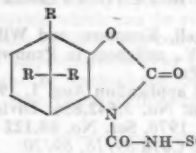
No Drawing. Original application Oct. 17, 1967, Ser. No. 675,796, now abandoned. Divided and this application Sept. 21, 1971, Ser. No. 182,512

Claims priority, application Switzerland, Oct. 28, 1966, 15,651/66; Apr. 24, 1967, 5,822/67; July 17, 1967, 10,187/67

Int. Cl. C07d *85/28*

U.S. Cl. 260—307 C 8 Claims

Compounds of the formula



wherein R and R^3 are as hereinafter described,

utilized in the preparation of bicyclic sulfonylurea derivatives by reaction with an alkyl metal compound, are described. The final products are useful as hypoglycemic agents.

3,770,762

DIAZEPINE COMPOUNDS AND METHODS FOR THEIR PRODUCTION

Donald E. Butler, Ann Arbor, Mich., assignor to Parke, Davis & Company, Detroit, Mich.

No Drawing. Filed Aug. 29, 1972, Ser. No. 284,756

Int. Cl. C07d *57/02*

U.S. Cl. 260—308 R 8 Claims

4 - aryl - 1,6-dihydro-1,3,9-trimethylpyrazolo[4,3-f]-s-triazolo[4,3-a][1,4]diazepines; and acid-addition salts. The aryl group is phenyl, o-fluorophenyl, or o-chlorophenyl. The compounds are pharmacological agents, especially anticonvulsant and antianxiety agents. They can be produced by reacting a thio-substituted diazepine (either a thiol or a thioether) with acetohydrazide. The thiols can be produced by reacting a diazepinone with phosphorus pentasulfide. The thioethers can be produced by reacting the thiols with sodium hydride and then with an alkyl halide.

3,770,763

N-[2-(NITRO-1-IMIDAZOLYL)ETHYL]IMIDES

John W. Cusic, Skokie, and Ernest F. Le Von, Evanston, Ill., assignors to G. D. Searle & Co., Chicago, Ill.

No Drawing. Continuation-in-part of application Ser. No. 796,225, Feb. 3, 1969, now Patent No. 3,642,836. This application Jan. 28, 1971, Ser. No. 110,665

Claims priority, application Great Britain, Jan. 30, 1970, 4,559/70

Int. Cl. C07d *49/36*

U.S. Cl. 260—309 5 Claims

Imides having a nitroimidazolylethyl group as a N-substituent are described herein. They are anti-bacterial and anti-protozoal agents. The compounds are prepared by the reaction of the appropriate imide with the chloroethylimidazole or with the tosylate or mesylate of the corresponding hydroxyethyl compound.

3,770,764

2-SUBSTITUTED-4,5-DICYANOIMIDAZOLES

Owen Wright Webster, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed May 25, 1971, Ser. No. 146,754

Int. Cl. C07d *49/36*

U.S. Cl. 260—309 10 Claims

Cyanogen chloride reacts with diaminomaleonitrile at about ambient temperature to produce 2-amino-4,5-dicyanoimidazole. Reaction of the product with acid and an alkali metal nitrite gives 2-diazo-4,5-dicyano-2H-imidazole, which is useful as an explosive. The 2-amino-4,5-dicyanoimidazole is useful as a chemical intermediate and as a buffering agent.

3,770,765

PRODUCTION OF CHLORINE-CONTAINING COPPER PHTHALOCYANINES

Edward E. Jaffe, Union, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Nov. 11, 1971, Ser. No. 197,978

Int. Cl. C09b *47/04*

U.S. Cl. 260—314.5 5 Claims

Chlorine-containing pigmentary copper phthalocyanines are prepared via the phthalonitrile synthesis using as the solvent a member from a specified group of organic sulfones. The product may be used as such or as a stabilizer for chlorine-free copper phthalocyanine pigment.

3,770,766

2-(2-AMINO-2,2-DIALKYLAMINO-3-HYDROXY-3-PHENYL-1H-BENZ[f]ISOINDOLE-1-ONES

Theodore S. Sulkowski, Wayne, and Albert A. Mascitti, Norristown, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Original application Mar. 10, 1970, Ser. No. 18,310, now Patent No. 3,624,101. Divided and this application Oct. 18, 1971, Ser. No. 190,299

Int. Cl. C07d *27/50*

U.S. Cl. 260—325 3 Claims

Novel 2,3 - dihydro-5-aryl-5H-benz[f]imidazo[2,1-a] isoindol-5-ols have been prepared which are pharmacologically active as antidepressant.

3,770,767

2-AMINOMETHYLINDOLE DERIVATIVES

Hisao Yamamoto, Noshinomiya, Shigeho Inaba, Takarazuka, Tadashi Okamoto, Ashiya, Toshiyuki Hirohashi, Kobe, Kikuo Ishizumi, Minoo, Michihiro Yamamoto, Takarazuka, Isamu Maruyama, Minoo, Kazuo Mori, Kobe, and Tsuyoshi Kobayashi, Minoo, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

No Drawing. Original application Nov. 20, 1968, Ser. No. 777,458, now Patent No. 3,652,551. Divided and this application Nov. 13, 1970, Ser. No. 89,480

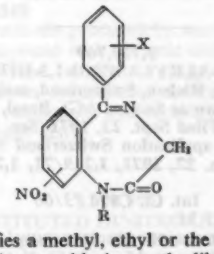
Claims priority, application Japan, Dec. 28, 1967, 43/84,961

The portion of the term of the patent subsequent to Mar. 27, 1990, has been disclaimed

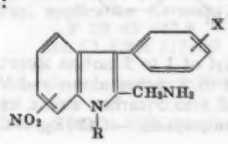
Int. Cl. C07d *27/56*

U.S. Cl. 260—326.15 2 Claims

Benzodiazepine derivatives, which have been well known as excellent tranquilizers and which have the formula

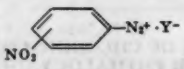


wherein R signifies a methyl, ethyl or the like group; and X signifies a hydrogen, chlorine or the like atom, are obtained by reacting with an oxidizing agent, such as chromic acid or the like, a novel 2-aminomethylindole derivative of the formula:

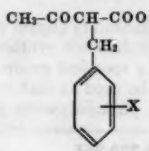


wherein R and X have the same significances as mentioned above, or its salt.

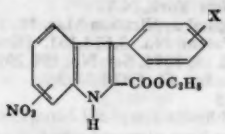
The starting 2-aminomethylindole derivative is prepared by reacting a nitrobenzenediazonium derivative of the formula:



wherein Y signifies a halogen atom, with an ester of β-keto-acid of the formula:



wherein X has the same significance as mentioned above, to form an indole-2-carboxylic acid ester derivative of the formula:



wherein X has the same significance as mentioned above, subjecting said derivative to N-alkylation, hydrolysis, and amidation to form a corresponding acid amide, dehydrating said acid amide to a corresponding carbonitrile, and then reducing said carbonitrile.

3,770,768

ALIPHATICALLY UNSATURATED ORGANOPOLYSILOXANES

Fred F. Holub and Abe Berger, Schenectady, and Bruce B. Hardman, Mechanicville, N.Y., assignors to General Electric Company

No Drawing. Filed Mar. 1, 1971, Ser. No. 119,837

Int. Cl. C07d *27/18, 27/52*

U.S. Cl. 260—326 E **5 Claims**

Organopolysiloxanes are provided wherein the organopolysiloxanes have either a terminal amino or aliphatically unsaturated imido group attached at one end and an alkenyl group attached at the other end, said amino or imido groups being attached to silicon through carbon-silicon bonds.

3,770,769

2-IMINO-5-ALKYLAMINO-1,3-DITHIANES

Rupert Schneider, Riehen, Switzerland, assignor to Sandoz Ltd. (also known as Sandoz AG), Basel, Switzerland

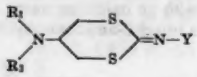
No Drawing. Filed Sept. 23, 1971, Ser. No. 183,269

Claims priority, application Switzerland Sept. 29, 1970, 14,399/70; Jan. 27, 1971, 1,219/71, 1,220/71, 1,221/71, 1,222/71

Int. Cl. C07d *73/00*

U.S. Cl. 260—327 M **13 Claims**

The present invention concerns novel compounds of the formula:



wherein R_1 is alkyl of 1 to 5 carbon atoms, R_2 is hydrogen or alkyl of 1 to 5 carbon atoms and Y is hydrogen, hydroxy, alkyl of 1 to 5 carbon atoms, cycloalkyl of 5 or 6 carbon atoms, cyano, —$COOR_3$, —COR_3 wherein R_3 is alkyl of 1 to 5 carbon atoms, alkenyl of 2 to 5 carbon atoms, cycloalkyl of 5 or 6 carbon atoms, or fluoro, chloro or bromo substituted alkyl of 1 to 5 carbon atoms, alkenyl of 2 to 5 carbon atoms or cycloalkyl of 5 or 6 carbon atoms, —$OCONHR_4$ or —$OCONR_4R_5$ wherein R_4 is alkyl of 1 to 5 carbon atoms, aryl or aryl substituted by alkyl of 1 to 5 carbon atoms, fluorine, chlorine or bromine and R_5 is hydrogen or alkyl of 1 to 5 carbon atoms.

The compounds possess insecticidal properties.

3,770,770

CERTAIN PEROXYESTERS HAVING A DEFINED SUBSTITUENT POSITIONED ON A CARBON ATOM AT LEAST BETA TO A PEROXY CARBON ATOM

Orville Leonard Mageli, Kenmore, and Wilbur H. McKellin, Buffalo, N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

No Drawing. Original application Aug. 1, 1966, Ser. No. 569,030, now Patent No. 3,542,856. Divided and this application Nov. 9, 1970, Ser. No. 88,122

Int. Cl. C07d *89/18, 89/20*

U.S. Cl. 260—327 H **6 Claims**

Beta-substituted peroxyesters useful as polymerization initiators are disclosed.

3,770,771

N-INDOLYLETHYL SUBSTITUTED AMIDES OF 1-AMINOCYCLOPENTANECARBOXYLIC ACID

Harvey E. Alburn, Chester, and Norman H. Grant, Delaware, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed Nov. 11, 1971, Ser. No. 197,971

Int. Cl. C07d *27/56*

U.S. Cl. 260—326.14 R **10 Claims**

The compounds are amides of 1-aminocyclopentanecarboxylic acid, having valuable pharmacodynamic properties in that they have anti-inflammatory activity in warm-blooded animals.

3,770,772

HYDROGENATION PROCESS

Wolfram R. Kroll, Somerville, N.J., assignor to Esso Research and Engineering Company

No Drawing. Filed Nov. 3, 1969, Ser. No. 873,489

Int. Cl. C07d *65/02*

U.S. Cl. 260—332.1 **2 Claims**

Sulfolene and alkyl substituted sulfolenes may be hydrogenated to sulfolanes and alkyl substituted sulfolane by utilizing a hydrogenation catalyst prepared by the reaction of organoaluminum or organoaluminum monoalkoxide reducing agents with transition metal salts in the presence of a solvent; such catalyst may be further activated by the addition of Lewis base or weak organic acids. In a preferred embodiment the catalyst is rendered insoluble in the solvent by oxygenation, preferably with air, and then removed by conventional filtration, centrifugation or decantation.

3,770,773

ANTIFUNGAL 2-(1,4-DIOXOCIN-6-YL)-4H-PYRAN-4-ONE AND A METHOD FOR ITS PRODUCTION

Donald Bruce Borders, Suffern, N.Y., and John Edgar Lancaster, Riverside, Conn., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed July 17, 1972, Ser. No. 272,280

Int. Cl. C07d *21/00*

U.S. Cl. 260—338 **2 Claims**

This disclosure describes 2-(1,4-dioxocin-6-yl)-4H-pyran-4-one, a new compound which exhibits antifungal activity and which is prepared by rearrangement of 2-

(3,8 - dioxatricyclo[5.1.0.0^{2,4}]oct-5-en-5-yl)-4H-pyran-4-one.

3,770,774

PROCESS FOR PURIFYING CRUDE CHLOROMETHYL DIHYDROSAFROLE AND PIPERONYL BUTOXIDE THEREFROM

Herbert R. Jenkins and Harry M. Iwata, Baltimore, and Asadollah A. Jabbarpour, Catonsville, Md., assignors to FMC Corporation, New York, N.Y.

No Drawing. Filed Nov. 19, 1970, Ser. No. 91,179
Int. Cl. C07d *13/10*
U.S. Cl. 260—340.5 3 Claims

Light-colored chloromethyl dihydrosafrole, capable of reacting with light-colored sodium butyl Carbitolate in the substantial absence of air at low temperatures to form piperonyl butoxide which can be recovered as a bottom product, is made by dissolving conventional dark-colored chloromethyl dihydrosafrole away from the color bodies with an alkane or cycloalkane of substantially lower boiling point than chloromethyl dihydrosafrole.

3,770,775

TETRAMETHYLENUMBELLIFERONE DIPHENYL-4-ACETATE

Gian Paolo Chiusoli and Mario Ferraris, Novara, and Giuliana Baldratti and Milena Menozzi, Milan, Italy, assignors to Societá Farmaceutici Italia, Milan, Italy

No Drawing. Filed Aug. 27, 1971, Ser. No. 175,745
Claims priority, application Italy, Aug. 31, 1970, 29,177/70
Int. Cl. C07d *7/26*
U.S. Cl. 260—343.2 R 1 Claim

A 4-diphenylacetic acid derivative is reacted with tetramethylenumbelliferone to form tetramethylenumbelliferone diphenyl-4-acetate. The condensation takes place in the presence of a suitable solvent, such as benzene, and of an alkaline hydroxide, such as sodium hydroxide, at the temperature between 20° and 30° C. and over a period of time ranging from 3 to 6 hours. Tetramethylenumbelliferone diphenyl-4-acetate is useful as an anti-inflammatory agent.

3,770,776

2-(HYDROXY - 1 - ALKYNYL)-5-OXOCYCLOPENT-1-ENEHEPTANOIC/OCTANOIC ACIDS AND DERIVATIVES THEREOF

Paul W. Collins, Wheeling, and Raphael Pappo, Skokie, Ill., assignors to G. D. Searle & Co., Chicago, Ill.

No Drawing. Continuation-in-part of application Ser. No. 740,976, June 28, 1968. This application June 4, 1970, Ser. No. 43,577
Int. Cl. C07c *61/36*
U.S. Cl. 260—345.7 9 Claims

2 - (hydroxy - 1 - alkynyl) - 5 - oxocyclopent - 1-eneheptanoic/octanoic acids and derivatives thereof are useful as anti-microbial agents, e.g., anti-bacterial, anti-protozoal and anti-fungal, and also as pepsin-inhibitory agents. These compounds are preparable by the sequence of reactions involving the condensation of 9-oxodecanoic or 10-oxoundecanoic acid with dimethyl oxalate, heating of the resulting 2,3,5-trioxo-4-methoxyalylcyclopentaneheptanoic acid or the corresponding octanoic acid derivative with hydrochloric acid to afford 2,3,5-trioxocyclopentaneheptanoic acid or the corresponding octanoic acid, catalytic hydrogenation of the latter substance to produce 2,5-dioxocyclopentaneheptanoic acid or the corresponding octanoic acid, reaction of that compound with ethanol in the presence of sulfuric acid, thus affording ethyl 2-ethoxy-5-oxocyclopent-1-eneheptanoate or the corresponding octanoate, saponification to afford the corresponding carboxylic acid, condensation of that acid with a 3-tetrahydropyran-2′-yloxy-1-alkynyl magnesium bromide, decomposition of the resulting Grignard adduct to yield a 2-(3-tetrahydropyran-2′-yloxy-1-alkynyl)-5-oxocyclopent-1-eneheptanoic acid or the corresponding octanoic acid and cleavage of the tetrahydropyran-2-yl group, thus affording a 2-(hydroxy-1-alkynyl)-5-oxocyclopent-1-eneheptanoic acid or the corresponding octanoic acid.

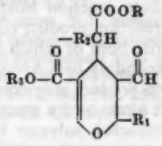
3,770,777

2-HYDROXY - 3 - (1-HYDROXYETHYL)-5-CARBOXY - 3,4 - DIHYDRO-2H-PYRAN-4-ACETIC ACID 4,5-DIMETHYL ESTER, 3-METHANESULFONATE

Robert C. Kelly, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Original application Aug. 24, 1970, Ser. No. 66,557, now Patent No. 3,703,530, dated Nov. 21, 1972. Divided and this application Apr. 12, 1972, Ser. No. 243,488
Int. Cl. C07d *7/14*
U.S. Cl. 260—345.8 1 Claim

A total synthesis of elenolic acid, Formula XIV (R and R_2 are hydrogen, R_1 and R_3 are methyl) and the analogs thereof, of Formula XIV:



XIV

wherein R and R_3 are alkyl of 1 to 8 carbon atoms, inclusive, wherein R_1 is alkyl of 1 to 4 carbon atoms, inclusive, and wherein R_2 is selected from the group consisting of hydrogen and alkyl of 1 to 4 carbon atoms, inclusive, is carried out by a multi-step process starting from cyclopentadiene. Compounds of Formula XIV have virucidal and hypotensive activity and can be used as hypotensive agents in mammals (U.S. Pat. 3,033,877) or as virucidal agents to decontaminate surgical instruments, hospital walls, swimming pools, or can be used for nasal washes in mammals.

3,770,778

1,2-AZIDONITRATES AND METHOD OF PRODUCING SAME

Walter Trahanovsky, Ames, Iowa, and M. Dwight Robbins, Fairfield, Ohio, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

No Drawing. Filed May 17, 1972, Ser. No. 253,969
Int. Cl. C07d *109/00*
U.S. Cl. 260—349 4 Claims

1,2-azidonitrates are produced by reacting an appropriate olefinic compound with an ionic azide and ceric ammonium nitrate; the compounds so produced are useful as intermediates in synthesizing the corresponding 1,2-aminohydroxy compounds and derivatives thereof which are physiologically active.

3,770,779

SUBSTITUTED DINITROANILINES

Karl Kiehs, Lampertheim, Karl-Heinz Koenig, Frankenthal, and Adolf Fischer, Mutterstadt, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen am Rhine, Germany

No Drawing. Filed Aug. 9, 1971, Ser. No. 170,278
Claims priority, application Germany, Sept. 2, 1970, P 20 43 442.8
Int. Cl. C07c *117/00*
U.S. Cl. 260—349 4 Claims

New and valuable substituted dinitroanilines having a good herbicidal action and a process for controlling the growth of unwanted plants with these compounds.

3,770,780
O-(NITROARYL)OXIMES OF 3-KETO STEROIDS
Allen F. Hirsch, Somerville, N.J., assignor to Ortho Pharmaceutical Corporation
No Drawing. Continuation-in-part of application Ser. No. 882,286, Dec. 4, 1969, now Patent No. 3,686,237. This application Dec. 2, 1970, Ser. No. 94,530
Int. Cl. C07c *169/20*
U.S. Cl. 260—397.3 **5 Claims**

O-(nitroaryl)oximes of variously substituted 3-keto steroids in which the aryl ring is in turn substituted in the ortho and/or para position with nitro groups are antilittering, anabolic and androgenic agents.

3,770,781
METHOD OF PRODUCING HYDROXYAMIDES AND REACTION PRODUCTS THEREOF
Louis Deane Rollmann and Sundaresa Srinivasan, Princeton, N.J., assignors to Mobil Oil Corporation
No Drawing. Filed Apr. 30, 1971, Ser. No. 139,186
Int. Cl. C07c *103/16, 103/38;* **C08g** *17/02*
U.S. Cl. 260—404 **9 Claims**

Beta-hydroxyamides are produced by the steps of (1) reacting a ketene and an aldehyde and (2) reacting the resulting intermediate reaction mixture with an amine. The intermediate reaction product contains a lactone and a polymeric material both of which react with the amine to form the corresponding beta-hydroxyamide. A portion of the final reaction product may consist of said polymer. The amide product alone or the reaction mixture containing amide and unreacted polymer is useful as a biodegradable nonionic detergent.

3,770,782
CONVERSION OF ALKYL NITRATES TO CARBOXYLIC ACIDS
Clyde E. Bishop, Indianapolis, Ind., assignor to Continental Oil Company, Ponca City, Okla.
No Drawing. Filed Dec. 30, 1970, Ser. No. 102,909
Int. Cl. C08h *17/36*
U.S. Cl. 260—413 **7 Claims**

Alkyl nitrates are oxidized with nitric acid in the presence of a vanadate salt and an NO_2 or nitrite-containing initiator to yield carboxylic acids containing varying numbers of carbon atoms. Selectivity as between the carboxylic acid types produced is attained by selective control of the temperature at which the nitric acid oxidation is carried out.

3,770,783
3,4-ALLENIC ALIPHATIC AMIDES
Clive A. Henrick and John B. Siddall, Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.
No Drawing. Original application Feb. 1, 1971, Ser. No. 111,768, now Patent No. 3,716,565. Divided and this application Aug. 21, 1971, Ser. No. 282,207
Int. Cl. A01n *9/20;* **C07c** *103/56*
U.S. Cl. 260—404 **8 Claims**

Preparation of di-unsaturated and tri-unsaturated aliphatic esters and amides by reaction of alkynyl alcohol with orthoester or amide ketal to prepare allenic ester or amide and rearrangement of allene, useful for insect control.

3,770,784
PRODUCTION OF IODOPHORS OF CHLORINATED ALKOXYLATED WOOL GREASE
Edward Watson Clark, Bradford, England, assignor to Woolcombers Limited, also trading as Westbrook Lanolin Company, Bradford, England
No Drawing. Filed Aug. 12, 1970, Ser. No. 63,343
Int. Cl. A61l *13/00;* **C11c** *3/00*
U.S. Cl. 260—408 **8 Claims**

A process for the production of water-soluble wool grease in which alkoxylated water-soluble wool grease is caused to combine with chlorine to reduce the iodine value by 50% to 95%.

3,770,785
BIS(DIALKYLAMINOMETHYL)PHENYLENE-DIPALLADIUM(II) COMPOUNDS
Swiatoslaw Trofimenko, Newark, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Continuation-in-part of abandoned application Ser. No. 792,841, Jan. 21, 1969. This application Sept. 24, 1970, Ser. No. 75,233
Int. Cl. C07d *107/00*
U.S. Cl. 260—429 R **12 Claims**

Certain bis(di-lower - alkylaminomethyl)phenylenedipalladium(II) halides (I), e.g., 3,6-bis(diethylaminomethyl)-1,2-phenylenedipalladium(II) dichloride and the corresponding 2,5-, 1,4- isomer, are prepared by reacting a complex inorganic palladium halide with a bis(dialkylamino)xylene, e.g., sodium palladium chloride with α,α'-bis(diethylamino)-p-xylene. Compounds I can be converted to novel chelates (II), e.g., 2,5-bis(diethylaminomethyl)-1,4-phenylenedipalladium(II) bis(2,4 - pentanedionate), or salts (III), e.g., 3,6-bis(diethylaminomethyl)-1,2-phenylenebis(pyridinepalladium(II)) μ-chloride hexafluorophosphate, by reaction with a chelating agent, e.g., 2,4-pentanedione, or a cyclic amine, e.g., pyridine. The compounds are useful as components of precious-metal decorating compositions and as catalysts for polymerizing acetylene.

3,770,786
FERROCENYL HYDROXYBUTENES
Chester W. Huskins, Huntsville, Ala., and Albert J. Thomas, Jr., Fayetteville, Ark., assignors to the United States of America as represented by the Secretary of the Army
No Drawing. Filed Mar. 29, 1971, Ser. No. 129,196
Int. Cl. C07f *15/02*
U.S. Cl. 260—439 CY **1 Claim**

Disclosed is the liquid, olefinic ferrocene derivative derived from vinyl magnesium chloride and diacetyl ferrocene, which derivative can be co-cured with hydroxy terminated polybutadiene polymers (HTPB) to yield a polymeric binder system for propellants having a chemically bound ballistic modifier as an integral part of the binder. The ferrocene derivative is a difunctional compound having two hydroxyl groups per molecule. Curing of the HTPB and the dihydroxy-ferrocene compound is accomplished by diisocyanates which is added in sufficient quantity so that all the hydroxyl groups of the HTPB and the ferrocene derivative are reacted.

3,770,787
VINYL FERROCENE BUTADIENE COPOLYMER BURNING RATE CATALYST
Jimmy D. Burnett, Arab, Ala., assignor to the United States of America as represented by the Secretary of the Army
No Drawing. Original application Sept. 17, 1969, Ser. No. 858,896. Divided and this application July 19, 1971, Ser. No. 164,143
Int. Cl. C07f *15/02*
U.S. Cl. 260—439 CY **3 Claims**

Copolymers of vinyl ferrocene and butadiene are disclosed along with the procedure for preparation. The copolymers are useful as a burning rate catalyst and provide a means for introducing and maintaining a high catalyst concentration in solid propellants inasmuch as the copolymer containing the iron catalyst is capable of serving as the binder replacing part of the normally used binders in solid propellants. Also disclosed is a typical solid propellant composition utilizing the copolymers of this invention as a binder replacement and burning rate catalyst.

3,770,788

SILYLATED PROSTAGLANDINS AND PROCESS THEREFOR

Gordon L. Bundy, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Continuation-in-part of application Ser. No. 34,518, May 4, 1970. This application May 24, 1972, Ser. No. 256,442

Int. Cl. C07f *7/18*

U.S. Cl. 260—448.8 R 20 Claims

Silylated intermediates useful for preparing prostaglandin-type compounds with a methyl or an ethyl substituent at C–15. The end products are useful for the same pharmacological purposes as the unsubstituted prostaglandins.

3,770,789

PROCESS FOR MANUFACTURING ALKYLALUMINUM COMPOUNDS

Eiichi Ichiki, Kazuo Iida, Atsuro Matsui, and Hidekimi Kadokura, Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

No Drawing. Filed Feb. 16, 1971, Ser. No. 115,800

Claims priority, application Japan, Feb. 21, 1970, 45/14,944

Int. Cl. C07f *5/06*

U.S. Cl. 260—448 A 11 Claims

Aluminum or its alloy is activated by heating aluminum or its alloy at 70°–200° C. in the presence of an activating agent comprising (1) a compound represented by the general formula R_2AlX, wherein R represents an alkyl, aryl, aralkyl or alkaryl group and X represents a hydrogen atom, an alkyl, aryl, aralkyl, alkaryl, alkoxy, aroxy, aralkoxy or alkaroxy group or a halogen atom, (2) a metal of Groups *Ia* and *IIa* of the Periodic Table or its compound, and (3) metallic copper or its compound.

3,770,790

PHENOXYPHENYL SILANES

Harold A. Clark, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

No Drawing. Filed Nov. 29, 1971, Ser. No. 203,035

Int. Cl. C07f *7/08*

U.S. Cl. 260—448.2 B 3 Claims

Novel silanes, phenoxyphenyl(diphenyl)methylsilane and phenoxyphenyl(dimethyl)phenylsilane, are inert fluids having a high index of refraction used as the stain media in the microscopic examination of tissue cultures.

3,770,791

PREPARATION OF 3-TRIMETHYLSILYL-LOWER ALKYL PROPIOLATE

Joseph G. Atkinson, Montreal, Quebec, and Patrice Belanger, Dollard des Ormeaux, Quebec, Canada, assignors to Merck Sharp & Dohme (I.A) Corp., New York, N.Y.

No Drawing. Filed July 18, 1972, Ser. No. 273,007

Claims priority, application Canada, Dec. 22, 1971, 130,887

Int. Cl. C07f *7/08*

U.S. Cl. 260—448.2 E 3 Claims

The preparation of 3-(trimethylsilyl) lower alkyl propiolate by the reaction of a lower alkyl propiolate and chlorotrimethylsilane in the presence of dry benzene and triethylamine is described. The product is a useful intermediate in the preparation of sodium 3-trimethylsilyltetradeuteriopropionate, a known useful water-soluble standard for ^1H-NMR, or in the preparation of the emulsifying agent, 3-trimethylsilylpropionic acid.

3,770,792

FLUORINATED OXYGEN-CONTAINING COPOLYMERS

Dario Sianesi, Adolfo Pasetti, and Costante Corti, Milan, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

No Drawing. Application Apr. 2, 1969, Ser. No. 812,844, now Patent No. 3,650,928, dated Mar. 21, 1972, which is a continuation-in-part of applications Ser. No. 446,292, Apr. 7, 1965, now Patent No. 3,442,946, dated May 6, 1969, and Ser. No. 650,257, June 30, 1967, now abandoned. Divided and this application June 10, 1971, Ser. No. 151,942

Claims priority, application Italy, Apr. 9, 1964, 7,678/64

Int. Cl. C08g *23/00;* C07c *43/12*

U.S. Cl. 260—463 2 Claims

Perfluorinated linear polyethers are prepared by liquid phase photochemical reaction of a mixture of perfluoropropylene and tetrafluoroethylene with oxygen in the presence of ultraviolet radiation.

3,770,793

AMINIUM AND DIIMONIUM SALTS USED AS POLYMERIZATION INHIBITORS OF DIALLYL DIGYLCOL CARBONATE

Allan Ellis Sherr, Warren, N.J., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Original application May 15, 1970, Ser. No. 37,867, now Patent No. 3,715,386. Divided and this application June 2, 1972, Ser. No. 259,179

Int. Cl. C07c *69/00*

U.S. Cl. 260—463 9 Claims

A method of inhibiting the polymerization of diallyl diglycol carbonate by the addition thereto of various aminium and diimonium salts and the products produced thereby are disclosed.

3,770,794

DIALKYLADAMANTANE DINITRILE

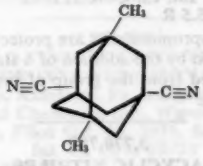
Robert M. Thompson, Chalfonte, Wilmington, Del., assignor to Sun Research and Development Co., Philadelphia, Pa.

No Drawing. Filed Oct. 22, 1971, Ser. No. 191,827

Int. Cl. C07c *121/46*

U.S. Cl. 260—464 2 Claims

This invention relates to a dialkyladamantane dinitrile; namely, 1,3-dimethyladamantane-5,7-dinitrile, and to the preparation of it and its homologues from a dialkyladamantane diacid. The preparation starts with the chlorination of the dialkyladamantane diacid which is followed by the amidation of the resulting diacid chloride and ends with the dehydration of the resulting diamide. The named dinitrile has the following structural formula:



and is a white, crystalline solid useful in various applications.

3,770,795

4,4,4-TRINITROBUTYL CYANOACETATE

Ellis R. White, Oakland, Calif., assignor to Shell Oil Company, New York, N.Y.

No Drawing. Filed Oct. 12, 1970, Ser. No. 81,635

Int. Cl. C07c *121/16*

U.S. Cl. 260—465.4 1 Claim

The novel 4,4,4-trinitrobutyl cyanoacetate and its use as a high-energy plasticizer of nitrocellulose binders for solid propellant systems.

3,770,796

CYANOHYDRIN COMPOUNDS

Walter W. Lawrence, Jr., Tom W. McKay, and Karl E. Wiegand, Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Apr. 7, 1971, Ser. No. 131,885
Int. Cl. C07c *141/40*
U.S. Cl. 260—465.4 1 Claim

It is disclosed that citric acid and salts thereof are readily produced by reacting acetone dicarboxyl ions, cyanide ions and alkali metal ions to produce an intermediate system which is subsequently reacted in an excess caustic system to form a salt of citric acid and that the salt is readily recovered by precipitation from the excess caustic system under proper conditions of concentration and temperature without requiring the formation of calcium salts. The recovered salt may be used directly or may be subjected to additional purification or may be converted to citric acid or other salts thereof by treatment with an acidification system such as sulfuric acid.

3,770,797

CATALYTIC CONVERSION OF ALKANONITRILES AND ALKENONITRILES TO A PRESELECTED ALKENONITRILE ISOMER

Bernard J. Wood, Santa Clara, Calif., assignor to Stamford Research Institute, Menlo Park, Calif.

Filed Apr. 12, 1971, Ser. No. 133,045
Int. Cl. C07c *121/02, 121/32*
U.S. Cl. 260—465.9 2 Claims

A process for the catalytic conversion of C_3 and higher alkanonitriles and C_4 and higher alkenonitriles to a preselected alkenonitrile isomer of the same carbon skeletal structure as the feed nitrile, the process comprising passing a vaporous mixture of said feed and hydrogen at elevated temperatures through a reaction zone over a palladium catalyst while maintaining the hydrogen content of said vaporous mixture at a relatively constant level as it passes through the reaction zone, the catalyst having been pretreated by exposure to the desired alkenonitrile isomer at elevated temperatures in the presence of hydrogen to adsorb said isomer on the catalyst surfaces. Specifically, acrylonitrile is produced from propionitrile.

3,770,798

STABILIZATION OF BETA-AMINOPROPIONITRILES

Richard V. Norton, Wilmington, Del., assignor to Sun Research and Development Co., Philadelphia, Pa.

No Drawing. Filed Jan. 20, 1972, Ser. No. 219,560
Int. Cl. C07c *121/42*
U.S. Cl. 260—465.5 R 20 Claims

Liquid β-aminopropionitriles are protected against thermal decomposition by the addition of a stabilizing amount of an acid selected from the group of organic carboxylic and sulfonic acids.

3,770,799

ACYCLIC NITRILES

Kuno Wagner and Manfred Hajek, Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Original application Nov. 26, 1969, Ser. No. 880,420. Divided and this application Jan. 27, 1972, Ser. No. 221,413
Claims priority, application Germany, Dec. 14, 1968, P 18 14 832.8
Int. Cl. C07c *121/42*
U.S. Cl. 260—465.5 R 2 Claims

Novel aldimines and ketimines which contain hydroxymethyl groups are provided. These new compounds are prepared by reacting Schiff's bases which have active hydrogen atoms in α-position to the $>C=N$ group with formaldehyde or formaldehyde yielding compounds. The new compounds can be used as plasticizing agents for the preparation of polyurethane plastics.

3,770,800

TEREPHTHALONITRILE PURIFICATION PROCESS

Richard V. Norton, Wilmington, Del., assignor to Sun Research and Development Co., Philadelphia, Pa.

Filed Feb. 22, 1972, Ser. No. 228,160
Int. Cl. C07c *121/52, 121/58*
U.S. Cl. 260—465 C 4 Claims

A process for the separation of benzonitrile and p-toluonitrile from admixture with terephthalonitrile by subjecting said mixture to extraction with acetonitrile, first at a temperature from about —20° C. to about 10° C. whereby benzonitrile is removed, and then to a second extraction at a temperature from about 30° C. to about 80° C. whereby p-toluonitrile is removed.

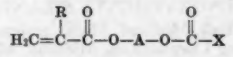
3,770,801

ESTERS OF SULFO-BENZOIC AND PHTHALIC ACID

William D. Emmons, Huntingdon Valley, and Graham Swift, Ambler, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

No Drawing. Filed Apr. 16, 1971, Ser. No. 134,905
Int. Cl. C07c *143/52*
U.S. Cl. 260—470 7 Claims

The present invention is concerned with novel monomers containing sulfonic acid groups or salts thereof and polymers thereof which are useful for many purposes, such as antistatic agents for textiles and other shaped articles formed of hydrophilic materials. They are useful for making copolymers that are particularly valuable in coating compositions, especially in the form of aqueous latices or organic solvent solutions thereof. Examples of the monomers are of the formula



wherein

R is hydrogen or lower (C_1–C_4)alkyl, such as methyl,
A is an alkylene group having 2 to 10 carbon atoms, at least 2 of which extend in one chain between the oxygen atoms, and
X is an aromatic nucleus or an alkyl group, substituted by a sulfonic acid group and optionally one or more groups selected from sulfonic acid, carboxylic acid, and lower alkyl, such as methyl, ethyl, propyl, or butyl.

3,770,802

METHOD FOR PREPARING 3-PROPIONYL-SALICYLIC ACID AND DERIVATIVES THEREOF

Enrico Sianesi, Milan, Italy, assignor to Recordati S.a.S. Chemical and Pharmaceutical Company, Lugano, Switzerland

No Drawing. Filed Nov. 16, 1970, Ser. No. 90,016
Claims priority, application Italy, Aug. 1, 1970, 28,190/70
Int. Cl. C07c *69/78*
U.S. Cl. 260—473 S 2 Claims

3-propionylsalicylic acid is made by isomerising 2-hydroxy - 3 - allylpropiophenone to 2-hydroxy-3-propenylpropiophenone, oxidizing the latter to 3-propionylsalicylic aldehyde and oxidizing the latter to 3-propionylsalicylic acid. This product can be converted to lower alkyl esters which can be used for the production of 3-methyl-

flavone-8-carboxylic acid and its esters, particularly the aminoalkyl esters which are therapeutically active.

3,770,803
α-FLUORO-1-NAPHTHALENEMALONIC ACID AND DERIVATIVES THEREOF

Bruno Cavalleri, Milan, and Elvio Bellasio, Albate, Como, Italy, Emilio Testa, Ticino, Switzerland, and Giulio Maffii, Milan, Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

No Drawing. Continuation-in-part of application Ser. No. 750,009, Aug. 5, 1968, now Patent No. 3,699,151. This application Dec. 6, 1968, Ser. No. 781,999
Int. Cl. C07c *63/56, 69/76*
U.S. Cl. 260—475 FR **3 Claims**

The application concerns a new class of α-fluoro-1-naphthalenealkanoic acids and their derivatives, i.e. metal salts, esters and amides, useful for the control of the growth of and for killing plants.

3,770,804
SIMULTANEOUS RECOVERY OF TEREPHTHALIC ACID AND DIMETHYL TEREPHTHALATE FROM CRUDE TEREPHTHALIC ACID

Hans Juergen Nienburg and Wolfgang Eisfeld, Ludwigshafen, and Hans Joachim Astheimer, Neuhofen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Aug. 6, 1971, Ser. No. 169,843
Claims priority, application Germany, Aug. 14, 1970, P 20 40 453.9
Int. Cl. C07c *69/82*
U.S. Cl. 260—475 R **2 Claims**

Recovery of pure terephthalic acid and pure dimethyl terephthalate by vaporizing crude terephthalic acid in a stream of gaseous methanol at a temperature of from 300° to 400° C., condensing pure terephthalic acid out from this mixture of methanol and terephthalic acid vapor by cooling it to a temperature of from 200° to 320° C. and passing the remaining vapors over a solid esterification catalyst. Terephthalic acid and dimethyl terephthalate are raw materials for the production of polyethylene terephthalates from which synthetic fibers are manufactured.

3,770,805
NITRO-SUBSTITUTED BUTYL ESTER

Albert L. Rocklin, Walnut Creek, Calif., assignor to Shell Oil Company, New York, N.Y.

No Drawing. Filed Oct. 12, 1970, Ser. No. 81,632
Int. Cl. C07c *101/10*
U.S. Cl. 260—482 R **1 Claim**

The novel 4,4,4-trinitrobutyl α,β-bis(difluoramino)isobutyrate and its use as a high-energy plasticizer of polymeric binders for solid propellant systems.

3,770,806
NITRO-SUBSTITUTED PROPYL ESTER

Albert L. Rocklin, Walnut Creek, Calif., assignor to Shell Oil Company, New York, N.Y.

No Drawing. Filed Oct. 12, 1970, Ser. No. 81,636
Int. Cl. C07c *101/10*
U.S. Cl. 260—482 R **1 Claim**

The novel 2,2-dinitropropyl α,β-bis(difluoramino)isobutyrate and its use as a high-energy plasticizer of polymeric binders for solid propellant systems.

3,770,807
PROCESS FOR PRODUCING γ-METHYL GLUTAMATE

Shozo Sumikawa, Ikuji Mohri, and Masayuki Miyaji, Ube, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Nov. 16, 1971, Ser. No. 199,249
Claims priority, application Japan, Dec. 2, 1970, 45/105,945
Int. Cl. C07c *101/22*
U.S. Cl. 260—482 P **3 Claims**

γ-Methyl glutamate is prepared from glutamic acid by treating glutamic acid with sulfuric acid in methanol. γ-Methyl glutamate is useful as an intermediate in the preparation of synthetic resins.

3,770,808
ALKYLOXY ACETIC ACID ESTERS

Edward Thomas Marquis, Austin, and Walter Howe Brader, Jr., Houston, Tex., assignors to Jefferson Chemical Company, Inc., Houston, Tex.

No Drawing. Filed Nov. 3, 1971, Ser. No. 195,448
Int. Cl. C07c *69/66*
U.S. Cl. 260—484 R **2 Claims**

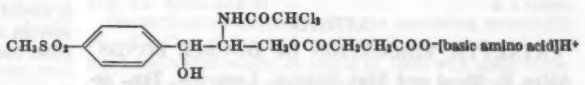
Alkyloxy acetic acid esters are useful lubricants and lubricant additives.

3,770,809
THIAMPHENICOL DERIVATIVES

Hisao Akiyama, Nishinomiya, and Toshiaki Komatsu and Toyozo Katsura, Takarazuka, Japan, assignors to Sumitomo Chemical Company, Limited, Higashi-ku, Osaka, Japan

No Drawing. Filed Feb. 17, 1971, Ser. No. 116,273
Claims priority, application Japan, Feb. 19, 1970, 45/14,584
Int. Cl. C07c *69/40*
U.S. Cl. 260—485 G **2 Claims**

Thiamphenicol derivatives of the following formula



wherein basic amino acid represents arginine, lysine, ornithine, histidine or tryptophan have characteristics of excellent solubility and give a neutral aqueous solution and are of very low toxicity. They give neither topical irritations nor necrosis upon injection and exhibit high blood level and are excreted into urine to a great extent as an active form following injection.

3,770,810
LIQUID HALO-VINYLIC COPOLYMERS HAVING HYDROXYL FUNCTIONALITY

Dale D. Dixon, Kutztown, Pa., assignor to Air Products and Chemicals, Inc., Wayne, Pa.

No Drawing. Filed Oct. 28, 1971, Ser. No. 193,535
Int. Cl. C07c *69/54*
U.S. Cl. 260—486 R **5 Claims**

Normally liquid vinylic copolymers having pendent hydroxyl functionality are obtained by copolymerizing a major amount of vinyl chloride monomer and a minor amount of polymerizable, functional group terminated vinylic unsaturated monomer in the presence of an effective amount of C_1 to C_3 bromohaloalkane in the absence of catalyst. The bromohaloalkane acts as chain transfer agent and is employed in an amount of 5 to 40% by weight based on the combined weight of the monomers. Such copolymers have utility in a wide range as intermediates through the hydroxyl functionality and halogen content, such as for example, as all or part of the polyol in formulations for fire retardant polyurethanes.

3,770,811

DIACRYLATE ESTERS OF HYDROGENATED BIS-PHENOL AND TOLYLENE

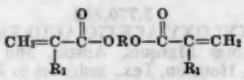
Henry L. Lee, Jr., 745 Sierra Madre Blvd., San Marino, Calif. 91108; Donald G. Stoffey, 15120 Hollis St., Hacienda Heights, Calif. 91745; Albert F. Stang, 12 Adler Strasse, 4 Dusseldorf 1, Germany; and Jan Alexander Orlowski, 1304 Rubio St., Altadena, Calif. 91001

No Drawing. Original application Feb. 12, 1971, Ser. No. 115,068. Divided and this application Mar. 23, 1973, Ser. No. 344,159

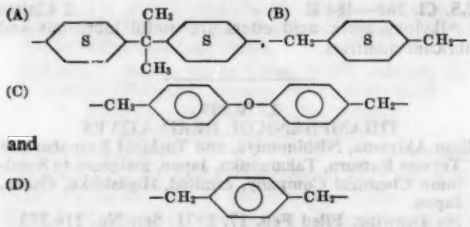
Int. Cl. C07c *69/54*

U.S. Cl. 260—486 R 5 Claims

Compounds of the formula:



wherein R is selected from



and

and R_1 is hydrogen, lower alkyl, or halogen, are utilized as binders in dental restorative compositions. The compounds are prepared by the reaction of an acryl chloride and derivatives thereof with the appropriate diol.

3,770,812

CATALYTIC FORMATION OF DOUBLE BONDS

Alden E. Blood and Max Statman, Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed May 28, 1970, Ser. No. 41,578

Int. Cl. C07c *69/54*

U.S. Cl. 260—486 D 12 Claims

In the iodine-catalyzed oxidative dehydrogenation of organic compounds, it has been found that the use of catalyst promoter compositions consisting essentially of about 0.01 to 1 percent by weight vanadia or iron oxide on an inert support increases conversions and yields at lower dehydrogenation temperatures.

3,770,813

PROCESS FOR PRODUCING GLYCOL ESTERS

John Kollar, Wyckoff, N.J., assignor to Halcon International, Inc.

No Drawing. Continuation of abandoned application Ser. No. 738,856, June 21, 1968. This application Oct. 26, 1971, Ser. No. 192,665

The portion of the term of the patent subsequent to Sept. 5, 1989, has been disclaimed

Int. Cl. C07c *67/04, 69/16, 69/28*

U.S. Cl. 260—497 R 17 Claims

This invention relates to a process for preparing glycol type esters by reacting an olefin with iodine, or an iodide and oxygen, in the presence of a carboxylate anion and a metal cation.

3,770,814

SALICYLIC ACID AND HALO-SUBSTITUTED SALICYLIC ACID SALTS OF OXYDIANILINE

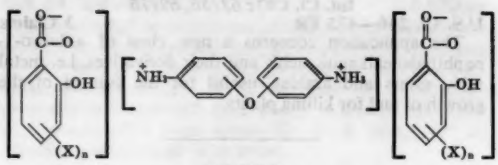
Theodore E. Majewski, Midland, and James P. Easterly, Bay City, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Original application May 3, 1968, Ser. No. 726,537, now Patent No. 3,689,536. Divided and this application Feb. 22, 1972, Ser. No. 228,358

Int. Cl. C07c *93/00*

U.S. Cl. 260—501.18 4 Claims

Compounds of the formula



in which X is H, Br, or Cl; and *n* is 0, 1, or 2.

3,770,815

OIL-SOLUBLE PHOSPHONIC ACID COMPOSITION

Loyd W. Jones, Tulsa, Okla., assignor to Amoco Production Company, Tulsa, Okla.

No Drawing. Filed Apr. 14, 1969, Ser. No. 816,032

Int. Cl. C07f *9/38*

U.S. Cl. 260—501.12 6 Claims

A solution of amino tri(lower alkyl phosphonic acid) in organic solvents is prepared by reacting an aqueous solution of the phosphonic acid with an oil-soluble amine having a hydrocarbon radical containing at least about ten carbon atoms, and dissolving the reaction product in a mixture of a substantially water-insoluble solvent, such as octanol, and a water-soluble solvent, such as methanol. Solubility of the amine phosphonate is increased by use of an amine salt of a carboxylic acid. The resulting solution is useful as a scale inhibitor, corrosion inhibitor, paraffin solvent and inhibitor, and acid retarder in oil wells. It has other uses outside the oil field.

3,770,816

DIPERISOPHTHALIC ACID COMPOSITIONS

Donald R. Nielsen, Corpus Christi, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

No Drawing. Continuation-in-part of application Ser. No. 418,541, Dec. 15, 1964. This application July 23, 1969, Ser. No. 844,164

Int. Cl. C07c *73/10*

U.S. Cl. 260—502 R 8 Claims

Diperisophthalic acid is formulated with inert hydrated salts which retain water of hydration at temperatures up to 30° C. but give up considerable water of hydration below the normal decomposition temperature of the acid such as below 130° C. to dampen the detonability of the diperisophthalic acid.

3,770,817

ALKYLAMINOALKYLSULFINIC ACID SALTS

Erwin Gams, Istvan Namenyi, Helmut Wahlig, Dietrich Erdmann, and Wolfgang Koch, Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

No Drawing. Filed July 10, 1970, Ser. No. 53,977

Claims priority, application Germany, July 12, 1969, P 19 35 457.5

Int. Cl. C07c *145/00*

U.S. Cl. 260—513.7 10 Claims

Alkylaminoalkylsulfinic acid salts of the formula

$$R—C_nH_{2n}—SO_2M$$

wherein R is a secondary or tertiary amino group containing 1–4 N-atoms and 8–40 C-atoms, at least one of which N-atoms is an amino group substituted by an alkyl group containing 8–18 carbon atoms; *n* is 1–6; and M is H or a metal or ammonium ion, have bacteriocidal, fungicidal and algicidal activity and are useful as disinfecting and cleansing agents.

3,770,818
PREPARATION OF MONOAMMONIUM ISOPHTHALATE
Richard V. Norton, Wilmington, Del., assignor to Sun Research and Development Co., Philadelphia, Pa.
Filed Aug. 18, 1972, Ser. No. 281,668
Int. Cl. C07c *63/24*
U.S. Cl. 260—515 P **4 Claims**

A process for making monoammonium isophthalate of high purity which comprises heating a solution of diammonium isophthalate to a temperature between about 180° C. to about 220° C., spraying said heated solution into a chamber at atmospheric or sub-atmospheric pressure, whereby liquid is evaporated and pyrolysis of said diammonium salt to the monoammonium salt occurs, and separating solid monoammonium isophthalate from said chamber.

3,770,819
PROCESS FOR MONOAMMONIUM TEREPHTHALATE AND TEREPHTHALIC ACID
Richard V. Norton, Wilmington, Del., assignor to Sun Research and Development Co., Philadelphia, Pa.
Filed Aug. 25, 1972, Ser. No. 284,011
Int. Cl. C07c *63/26*
U.S. Cl. 260—515 P **4 Claims**

A process for making monoammonium terephthalate of high purity which comprises heating a solution of diammonium terephthalate to a temperature between about 210° C. to about 260° C., spraying said heated solution into a chamber at atmospheric or sub-atmospheric pressure, whereby liquid is evaporated and pyrolysis of said diammonium salt to the monoammonium salt occurs, and separating solid monoammonium terephthalate from said chamber. In another embodiment, the monoammonium terephthalate is converted to terephthalic acid and diammonium terephthalate, which salt is recycled.

3,770,820
IODINATED ANILIC ACIDS
James H. Ackerman, Bethlehem, N.Y. (79 Devon Road, Delmar, N.Y. 12054)
No Drawing. Division of application Ser. No. 25,262, Apr. 2, 1970, now Patent No. 3,666,760, which is a continuation-in-part of application Ser. No. 808,653, Mar. 19, 1969, now Patent No. 3,609,149, which is a continuation-in-part of application Ser. No. 715,558, Mar. 25, 1968, which in turn is a continuation-in-part of application Ser. No. 550,614, May 17, 1966, both now abandoned. Said application Ser. No. 808,653, being a continuation-in-part of application Ser. No. 715,583, Mar. 25, 1968, now abandoned. This application Jan. 25, 1971, Ser. No. 109,631
Claims priority, application Great Britain, May 11, 1967, 21,897/67
Int. Cl. C07c *149/40*
U.S. Cl. 260—516 **21 Claims**

3-amino-2,4,6-triiodobenzoic acids optionally substituted in the 5-position by amino or carboxy or a derivative thereof react with dibasic acid anhydrides to give the corresponding cyclic imides (A), which can be hydrolyzed to the corresponding anilic acids (B). The latter can be further alkylated on the anilide nitrogen atom. Compounds A and B are useful as cholecystographic and urographic agents.

3,770,821
SUBSTITUTED β-ARYLAMIDOACRYLIC ACIDS
Robert Thomas Buckler, Edwardsburg, Mich., and Harold Eugene Hartzler, Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.
No Drawing. Filed Oct. 16, 1970, Ser. No. 81,622
Int. Cl. C07c *103/30*
U.S. Cl. 260—518 R **27 Claims**

Certain substituted β-arylamidoacrylic acids and a method of preparing them are disclosed. These compounds are useful as antiinflammatory and diuretic agents.

3,770,822
S-LOWER ALKANOYL- AND ACETONYL-AMINOMETHYLCYSTEINE
John D. Milkowski, Rahway, Daniel F. Veber, Plainfield, and Ralph F. Hirschmann, Scotch Plains, N.J., assignors to Merck & Co., Inc., Rahway, N.J.
No Drawing. Original application Aug. 7, 1967, Ser. No. 658,665, now Patent No. 3,560,521, dated Feb. 2, 1971. Divided and this application June 17, 1970, Ser. No. 57,883
Int. Cl. C07c *149/24*
U.S. Cl. 260—534 S **2 Claims**

Novel protecting groups for peptides containing a cyteine residue. Process for the synthesis of peptides containing a cysteine residue wherein the mercapto function of the cysteine residue is protected by a labile blocking group. Novel intermediates useful in peptide synthesis.

3,770,823
OXYPERFLUOROMETHYLENE POLYMERS
Franco Gozzo, Via Don Griffanti 1, and Giorgio Carraro, Via Damiano Chiesa 8, both of Saronno, Italy
No Drawing. Continuation-in-part of application Ser. No. 420,718, Dec. 23, 1964, now Patent No. 3,392,097. This application Apr. 4, 1968, Ser. No. 718,917
Claims priority, application Italy, Jan. 2, 1964, 5/64, Patent 42,565
Int. Cl. C07c *59/22*
U.S. Cl. 260—535 H **2 Claims**

Oxyperfluoromethylene polymers consisting essentially of $—CF_2O—$ chains and head-to-tail succession and having a molecular weight in excess of 1000 with main infrared-absorption peaks at substantially 1035 and 1225 $cm.^{-1}$.

3,770,824
SUBSTITUTED ALPHA,ALPHA-DICHLOROMETHANE-SULFENYL CHLORIDES AND THEIR MANUFACTURE
Wendell Gary Phillips, Olivette, Mo., assignor to Monsanto Company, St. Louis, Mo.
No Drawing. Filed May 3, 1971, Ser. No. 139,976
Int. Cl. C07c *145/00*; C07d *29/34, 27/02*
U.S. Cl. 260—543 H **21 Claims**

Alpha-carbamoyl-alpha,alpha-dichloro-methane-sulfenyl chlorides and their method of manufacture, which compounds are pesticidally active and/or are useful precursors for a variety of pesticides.

3,770,825
2-SUBSTITUTED AMINO CYCLOALKYL-CARBOXAMIDES
William Taub and Moshe Avramoff, Rehovot, Israel, assignors to Yeda Research and Development Co., Ltd., Rehovot, Israel
No Drawing. Continuation-in-part of abandoned application Ser. No. 768,172, Oct. 16, 1968. This application Dec. 7, 1970, Ser. No. 95,950
Int. Cl. C07c *103/86*
U.S. Cl. 260—557 B **5 Claims**

There is provided a novel class of anti-inflammatory agents consisting of 2-cycloalkylaminocycloalkanecarboxy derivatives and methods of preparing the same. The cycloalkyl moieties in these novel compounds are those having

a principal ring size of 6 to 10 carbon atoms and optionally having bridgehead carbon atoms bonded across the cyclic nucleus.

3,770,826
N,N'-THIO-BIS-CARBAMIC ACID AMIDES
Rüdiger Schubart and Ernst Roos, Cologne, and Manfred Abele, Porz, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany
No Drawing. Original application Nov. 18, 1970, Ser. No. 90,859, now Patent No. 3,671,503. Divided and this application Dec. 10, 1971, Ser. No. 206,869
Int. Cl. C07c *103/30*
U.S. Cl. 260—558 S **4 Claims**

N,N'-thio-bis-carbamic acid amides, their preparation by reacting at least 2 mols of a carboxylic acid amide with 1 mol of sulphur dichloride in the presence of an acid binding agent and their utility as rubber vulcanization retarders.

3,770,827
SEPARATION AND PURIFICATION OF CHELATING AGENTS
Arthur W. Langer, Jr., 175 Oakwood Road, Watchung, N.J. 07060, and Thomas A. Whitney, 812 Washington Ave., Linden, N.J. 07036
Continuation-in-part of application Ser. No. 872,955, Oct. 31, 1969, which is a continuation-in-part of application Ser. No. 808,328, Mar. 18, 1969. This application Apr. 19, 1972, Ser. No. 245,556
Int. Cl. C07c *87/38*
U.S. Cl. 260—563 R **4 Claims**

Monomeric or polymeric organic chelating agents are separated and/or purified from nonchelating agents, other chelating agents, and/or isomeric material (i.e., structural isomers, geometric isomers, and optical isomers of the same material) by complexation with an inorganic lithium salt. The chelating agent may be recovered thereafter by destabilization of the complex. The chelating agent contains at least two tertiary nitrogen functionalities.

3,770,828
SUBSTITUTED 3-PHENYLINDAN-1-ONE OXIMES
James M. Berdahl, Evansville, Ind., assignor to Mead Johnson & Company, Evansville, Ind.
No Drawing. Filed Oct. 20, 1967, Ser. No. 676,714
Int. Cl. C07c *131/00*
U.S. Cl. 260—566 A **5 Claims**

3 - (2 - dimethylaminoethyl)-3-phenylindan-1-one oxime prepared by alkylation of the disodium salt of 3-phenylindan-1-one oxime with dimethylaminoethyl chloride is identical with the oxime prepared from 3-(2-dimethylamino-ethyl)-3-phenylindan-1-one. The oxime has strong antireserpine action.

3,770,829
DIHYDROISOPHORONE PURIFICATION PROCESS
William E. Wellman, Edison, Paul E. Burton, Westfield, and William D. Diana, Somerville, N.J., assignors to Esso Research and Engineering Company
Filed Sept. 13, 1968, Ser. No. 759,745
Int. Cl. C07c *45/24*
U.S. Cl. 260—586 R **19 Claims**

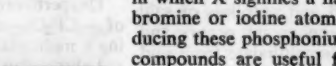
Method of purifying an oxygenated hydrocarbon mixture that contains dihydroisophorone and beta-isophorone and alpha-isophorone as major impurities by first separating both dihydroisophorone and beta-isophorone from alpha-isophorone and then heating the dihydroisophorone and beta-isophorone in the presence of a free radical catalyst to substantially isomerize beta-isophorone to alpha-isophorone and thereafter separating the resulting alpha-isophorone from dihydroisophorone to produce a substantially pure dihydroisophorone product.

3,770,830
PROCESS OF PREPARING STABILIZED AQUEOUS FORMALDEHYDE SOLUTIONS
Cesare Reni and Luigi Lugo, Milan, Italy, assignors to Società Italiana Resine S.p.A., Milan, Italy
No Drawing. Filed Dec. 7, 1967, Ser. No. 688,706
Claims priority, application Italy, Dec. 14, 1966, 31,072/66, Patent 783,293
Int. Cl. C07c *47/04*
U.S. Cl. 260—606 **5 Claims**

The invention relates to a process for stabilizing an aqueous formaldehyde solution comprising adding to the initially unstabilized aqueous formaldehyde solution a stabilizer precursor and heating the precursor containing formaldehyde solution to a temperature of at least 50° C. The stabilizer precursor is defined as being a substance which is not effective as a stabilizer per se but, when it is present in a formaldehyde solution, the solution becomes stabilized when subjected to a heat treatment at temperatures exceeding 50° C. Preferably the precursor is a triazine resin such as a melamine and/or benzoguanamine resin.

3,770,831
TRIS-(3-HALO-2-HYDROXYPROPYL)-HYDROXYMETHYLPHOSPHONIUM CHLORIDE
Ludwig Maier, Zurich, Switzerland, assignor to Monsanto Company, St. Louis, Mo.
No Drawing. Original application Nov. 18, 1970, Ser. No. 90,808, now Patent No. 3,681,126. Divided and this application Apr. 5, 1972, Ser. No. 241,478
Claims priority, application Switzerland, Nov. 25, 1969, 17,836/69
Int. Cl. C07f *9/54*
U.S. Cl. 260—606.5 F **2 Claims**

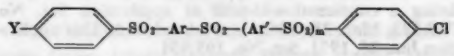
Tris - (3 - halo-2-hydroxypropyl)-hydroxymethylphosphonium chloride compounds of the structure



in which X signifies a halogen atom including a chlorine, bromine or iodine atom are provided. A method of producing these phosphonium chlorides also is disclosed. The compounds are useful for imparting flame resistance to combustible articles, particularly textile materials made from fibrous nylon. Also, these compounds serve as intermediate chemical for the preparation of other useful compounds.

3,770,832
AROMATIC SULPHONES
Victor Jeffrey Leslie, Potters Bar, and John Brewster Rose, Letchworth, England, assignors to Imperial Chemical Industries Limited, London, England
No Drawing. Filed July 17, 1970, Ser. No. 55,980
Claims priority, application Great Britain, July 31, 1969, 38,437/69; Mar. 19, 1970, 13,354/70
Int. Cl. C07c *147/06*
U.S. Cl. 260—607 A **7 Claims**

New aromatic sulphones of the formula



where Y is fluorine or hydroxy, *m* is zero or one and each of Ar and Ar' is a bivalent aromatic radical, and (where Y is hydroxy) the alkali metal salts thereof, are valuable intermediates for the preparation of aromatic polymers. The alkali metal salts are readily polymerised, or copolymerised with an alkali metal salt of 4-(4-chlorophenyl-sulphonyl) phenol, as described in British specification 1,153,035. The bivalent aromatic radicals Ar and Ar' are such that H—Ar—H or H—Ar'—H contains two hydrogen atoms which can readily be replaced by reaction with sulphonyl chlorides under Friedel-Crafts con-

ditions in two distinct stages. In particular, Ar and Ar' may have the structure

3,770,833

METHOD FOR PRODUCING 3,5-DIALKOXY-PHENOLS

Henry Bader and Edwin G. Jahngen, Jr., Newton Center, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

No Drawing. Filed Mar. 30, 1970, Ser. No. 24,005

Int. Cl. C07c *43/22*; G03c *5/54*

U.S. Cl. 260—613 D 15 Claims

An improved process for producing 3,5-dialkoxyphenols useful as intermediates in the synthesis of metal complexed azomethine dyes. Essentially, the process involves heating a mixture of phloroglucinal (1,3,5-benzenetriol) and an alcohol having from 1–8 carbon atoms in the presence of an azeotropic medium and an acid catalyst.

3,770,834

NITROSATION OF PHENOLS WITH NITROGEN TRIOXIDE

Thomas J. Prosser, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

No Drawing. Continuation-in-part of application Ser. No. 639,283, May 18, 1967, now Patent No. 3,510,527. This application Apr. 2, 1970, Ser. No. 25,301

Int. Cl. C07c *39/02, 79/22*

U.S. Cl. 260—621 N 14 Claims

Disclosed is a process for nitrosating nitrosatable phenolic material. Nitrogen trioxide and the phenolic material are introduced simultaneously at specific rates into an agitated, acidic, aqueous medium established and maintained in the temperature range from about —20 to about 20° C., and having an initial concentration of nitrous acid in a range from about 0 to about 1% by weight of the aqueous medium. The initial pH of the aqueous medium is less than about 5, preferably about 1, and comprises water and, dissolved in the water, acid material selected from the group consisting of water-soluble strong acids like nitric acid and sulfuric acid. The rate of introduction of the phenolic material into the aqueous medium is preferably substantially the rate at which the phenolic material is nitrosated in the aqueous medium. The rate of introduction of nitrogen trioxide into the aqueous medium is substantially at the rate at which a slight stoichiometric excess, relative to the phenolic material being introduced into the aqueous medium, of nitrous acid is established and maintained in the reaction medium. As reaction takes place nitrosated phenolic product forms and precipitates. Preferably the reaction mixture that results is maintained with agitation in the temperature range until the reaction is substantially complete, and then the precipitated nitrosated phenolic product is separated from the reaction mixture.

3,770,835

STABILIZATION OF PENTACHLOROPHENOL

Taniel A. Garabedian, East St. Louis, Ill., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Continuation of abandoned application Ser. No. 777,167, Nov. 19, 1968. This application July 26, 1971, Ser. No. 164,878

Int. Cl. C07c *39/24*

U.S. Cl. 260—623 R 4 Claims

Hydroxybenzaldehydes such as salicylaldehyde, when present in a stabilizing amount, are useful in inhibiting degradation of pentachlorophenol.

3,770,836

CYCLOPROPYL CYCLOHEXANES

Roger A. Comes, Bon Air, Va., assignor to Philip Morris Incorporated, New York, N.Y.

No Drawing. Filed June 15, 1970, Ser. No. 46,463

Int. Cl. C07c *35/08, 35/22*

U.S. Cl. 260—631 R 3 Claims

Cyclohexanes and cyclohexanols having a cyclopropane substituent are prepared from terpenes and derivatives thereof which are useful as fragrances or flavors.

3,770,837

HYDROGENOLYSIS OF BETA-HYDROXY CARBOXYLIC ACID LACTONES

Nicolai Alexander Favstritsky and Adin L. Stautzenberger, Corpus Christi, Tex., assignors to Celanese Corporation, New York, N.Y.

No Drawing. Filed Jan. 5, 1971, Ser. No. 104,181

Int. Cl. C07c *31/20*

U.S. Cl. 260—635 D 12 Claims

A beta-hydroxy carboxylic acid lactone, such as beta-hydroxy propionic acid lactone, is hydrogenolyzed to the corresponding 1,3-propanediol in the presence of a rhenium catalyst at elevated temperatures and pressures.

3,770,838

PROCESS FOR PREPARING FLUOROCARBON HALIDES

Robert E. A. Dear and Cyril Woolf, Morristown, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed June 2, 1971, Ser. No. 149,362

Int. Cl. C07c *17/04, 19/08*

U.S. Cl. 260—653 4 Claims

Fluorocarbon halides are prepared by reacting an unsaturated fluorocarbon with a cyanogen halide and an ionizable fluoride salt.

3,770,839

METHOD FOR PREPARING CYCLODODECATRIENE-1,5,9

Shunsuke Matsushima, Ibaraki, Japan, assignor to Sumitomo Chemical Co., Ltd., Osaka, Japan

No Drawing. Filed June 29, 1970, Ser. No. 50,914

Claims priority, application Japan, July 9, 1969, 44/54,660

Int. Cl. C07c *3/02*

U.S. Cl. 260—666 B 11 Claims

Cyclododecatriene-1,5,9 is prepared by catalyzing the trimerization of butadiene-1,3 with the reaction product of an organic titanate, phosphoric acid, and aluminum alkyl halide that has a Ti—O—P linkage.

3,770,840

CYCLOPROPANE PROCESS

Lawrence H. Shepherd, Jr., Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

No Drawing. Original application July 2, 1970, Ser. No. 52,077, now Patent No. 3,670,001, dated June 13, 1972. Divided and this application Sept. 27, 1971, Ser. No. 184,273

Int. Cl. C07c *5/20*

U.S. Cl. 260—666 P 9 Claims

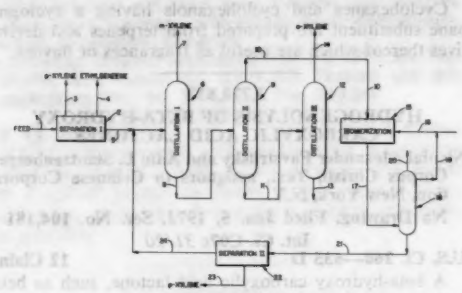
Organoaluminum halides in which the aluminum atom carries a substituted allyl carbinyl group or a substituted cyclopropylcarbinyl group are formed by reacting an aluminacyclopent-3-ene moiety with a primary aliphatic monohalide. The resultant organoaluminum halides are versatile intermediates. Hydrolysis yields substituted 1-alkenes and ring substituted methylcyclopropanes, respectively. Novel classes of substituted cyclopropanes are producible in this manner.

3,770,841

SEPARATION OF AROMATIC MIXTURES

Clyde C. Meyers, Jr., Beaumont, Tex., assignor to Mobil Oil Corporation

Filed June 25, 1971, Ser. No. 156,757
Int. Cl. C07c *5/24*
U.S. Cl. 260—668 A 23 Claims



A process for the separation and manufacture of components from a C_8^+ aromatics mixture, including para-xylene, meta-xylene and ortho-xylene by subjecting the mixture to a chromatographic separation to remove any ethylbenzene and most or all of the para-xylene, distilling the resultant mixture in a first distillation station to remove a portion of the meta-xylene; distilling the residue in a second distillation station to remove the remainder of the meta-xylene and some of the ortho-xylene and passing this distillate to an isomerization station, removing the residue to a third distillation station and distilling the ortho-xylene therefrom; isomerizing said distillate from the second distillation station for para-xylene formation, chromatographically separating the mixture from the isomerization to remove para-xylene and recycling the remaining mixture to the first distillation stage. The process can be practiced with (1) omission of ortho-xylene production by by-passing the third distillation station, (2) omission of meta-xylene production by by-passing the first distillation station, or (3) omission of both ortho- and meta-xylene production by-passing the first and third distillation stations.

3,770,842

METHOD OF SEPARATING ALIPHATICALLY UNSATURATED HYDROCARBONS BY CONTACTING SAID HYDROCARBONS WITH A SOLID, WATER-INSOLUBLE, SEMI-PERMEABLE FILM MEMBRANE

Edward F. Steigelmann and Robert D. Hughes, Park Forest, Ill., assignors to Standard Oil Company, Chicago, Ill.

No Drawing. Filed June 29, 1972, Ser. No. 267,540
Int. Cl. C07c *9/00, 11/12*
U.S. Cl. 260—677 A 14 Claims

There is described the separation of aliphatically-unsaturated hydrocarbons from gaseous mixtures by the combined use of flooded-cell, liquid barrier permeation and metal complexing techniques. The liquid barrier is disposed as a continuous, distinct liquid phase in contact with a film membrane, and the barrier contains complex-forming metal ions in aqueous solution. The hydrocarbon feed gas is contacted with the liquid barrier containing a surface-active agent in solution in the liquid barrier. The surface-active agent serves to improve the selectivity of the separation. The metal ions in the liquid barrier may be, for example, noble metal, nickel, mercuric, cuprous or other metal ions, and mixtures of the metal ions, with or without other cations, may be used. The separation of ethylene from ethane and methane is of particular interest.

3,770,843

OLEFIN PREPARATION

Nathan Kornblum, West Lafayette, Ind., assignor to Purdue Research Foundation

No Drawing. Filed Aug. 17, 1972, Ser. No. 281,576
Int. Cl. C07c *11/20*
U.S. Cl. 260—677 R 4 Claims

Both symmetrical and unsymmetrical olefins are obtained by the elimination of two nitro groups from vicinal dinitro compounds. The elimination is effected by treatment of the vicinal dinitro compound with sodium, potassium, lithium or ammonium sulfide or sodium, potassium or lithium thiophenoxide in an aprotic solvent. The reaction is accelerated by light.

3,770,844

HYDROGENATION OF ORGANIC COMPOUNDS

Joseph K. Mertzweiller and Horace M. Tenney, Baton Rouge, La., assignors to Esso Research and Engineering Company

No Drawing. Continuation-in-part of application Ser. No. 1,281, Jan. 7, 1970, now Patent No. 3,677,969, which is a continuation-in-part of abandoned applications Ser. Nos. 761,792 and 761,793, both Sept. 23, 1968, the latter being a continuation-in-part of abandoned application Ser. No. 674,097, Oct. 10, 1967. This application May 16, 1972, Ser. No. 253,763
Int. Cl. C07c *5/02*
U.S. Cl. 260—683.9 14 Claims

Novel sulfided hydrogenation catalysts are formed by impregnating a suitable support material with an aqueous solution of a salt of a transition metal; heat-treating the impregnated support at a temperature above 500° F. to form chemical complexes on the surface of the support and to drive off moisture and absorbed oxygen; contacting the supported metal complex with hydrogen sulfide; activating the surface complex by contacting the supported metal sulfide complex with a soluble organometallic compound wherein the metal constituent is selected from Groups I, II and III of the Periodic Chart of the Elements, and thereafter treating the activated support material in the presence of a gaseous stream containing hydrogen at a temperature of at least 300° F. to form a highly stable heterogeneous sulfided catalyst. The novel supported catalysts of the instant invention have been found to be highly active for the hydrogenation of organic feedstocks containing sulfur under extremely mild conditions.

3,770,845

PARAFFIN HYDROISOMERIZATION WITH A COMBINED CATALYST OF A HYDROGENATION COMPONENT AND A POLYVALENT METAL CATION-EXCHANGED ZEOLITE

Alfred E. Hirschler, Springfield, Pa., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

No Drawing. Continuation-in-part of applications Ser. No. 715,944, Mar. 26, 1969, and Ser. No. 28,608, Apr. 15, 1970. This application Nov. 17, 1970, Ser. No. 90,463
The portion of the term of the patent subsequent to Nov. 17, 1970, has been disclaimed
Int. Cl. C07c *5/30*
U.S. Cl. 260—683.65 10 Claims

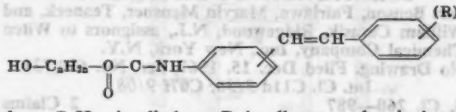
Paraffin hydroisomerization of gasoline-boiling-range paraffins is carried out at a temperature of 300–340° C. with a combined catalyst of a hydrogenation component and a zeolite which is at least 5% crystalline, evolves at 1800° F. ignition analysis 0.5–2 molecules of water for each atom of exchanged polyvalent metal, and which contains less than one alkali metal cation for every ten atoms of aluminum, hydrogen and at least 25% of the electronic equivalents are polyvalent metals, i.e. yttrium, gadolinium, lanthanum, magnesium, silver, zinc, aluminum, nickel, chromium and combinations thereof. The hydrogenation component is at least one of the following metals, their oxides or sulfides: nickel, cobalt, palladium, ruthenium, rhodium, rhenium and platinum.

3,770,846
NOVEL COMPOSITIONS

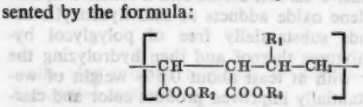
Fred A. Stuber, North Haven, and Henri Ulrich, North Branford, Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Filed Sept. 13, 1971, Ser. No. 180,203
Int. Cl. C08f 27/06, 27/08, 29/48
U.S. Cl. 260—823 7 Claims

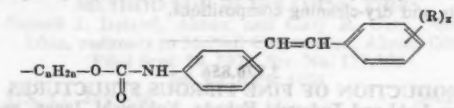
Stilbenes of the formula:



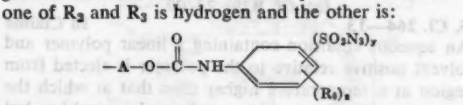
where C_nH_{2n} is alkylene, R is alkoxy, and x is 1 to 3, and radiation sensitive polymers derived therefrom, are described. The radiation sensitive polymers include (i) those which are characterized by a recurring unit represented by the formula:



wherein R_1 is lower-alkoxy or phenyl, one of R_2 and R_3 is hydrogen and the other is:



where C_nH_{2n} and $(R)_x$ are as above, and (ii) those which are characterized by a combination of two recurring units in the same molecule one of the units being that present in the polymers (i) and the other unit having the same general formula above wherein R_1 is as above defined, one of R_2 and R_3 is hydrogen and the other is:



where A is alkylene as defined above, R_6 is lower alkyl or halogen, x is 1 or 2, y is 0 to 2 and $x+y$ is 1 to 3. Water soluble salts of the above polymers are also disclosed. The stilbene moiety in said polymers acts as a built-in sensitizer for the radiation sensitization of the sulfonazido moiety. The radiation-sensitive polymers are useful in a variety of ways including modification of the surface of —C—H containing polymers, bonding basic dyestuffs to non-dye receptive substrates, photoimaging and the like.

3,770,847
CURABLE ORGANOPOLYSILOXANES

Guenther Fritz Lengnick, Adrian, and Eugene Ray Martin, Onsted, Mich., assignors to Stauffer Chemical Company

No Drawing. Filed Dec. 30, 1971, Ser. No. 214,377
Int. Cl. C08f 35/02
U.S. Cl. 260—827 7 Claims

Curable organopolysiloxane compositions and a method for curing the same by incorporating therein hydroxylamines and a cross-linking agent.

3,770,848
SELF-CROSSLINKING POWDER CONTAINING CARBOXY AND EPOXY GROUPS ADMIXED WITH A FLOW CONTROL AGENT

Santokh S. Labana, Dearborn Heights, and Yun F. Chang, Plymouth, Mich., assignors to Ford Motor Company, Dearborn, Mich.

No Drawing. Filed Aug. 16, 1971, Ser. No. 172,238
Int. Cl. C08g 45/04, 45/06
U.S. Cl. 260—836 4 Claims

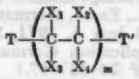
Powder coating compositions are disclosed. In general, individual powder coating compositions of this invention are a mixture of several materials. The most significant materials employed in the powder coatings include the following. A copolymer containing crosslinkable, functional groups, forms the most important constituent of the powder coating. This copolymer has a glass transition temperature in the range of 40° C. to 90° C. and a molecular weight ($\overline{M}_n$) in the range from about 2,000 to about 15,000. Another material of an individual composition is a flow control agent which forms at least 0.05% by weight of the mixture. The flow control agent is a polymer having a molecular weight ($\overline{M}_n$) of at least 1000. Also, the flow control agent has a glass transition temperature at least 50° C. lower than the glass transition temperature of the copolymer. Other materials which may be employed in individual powder coating compositions are catalysts, pigments, antistatic agents and plasticizers.

3,770,849
LACTAM-VINYL BLOCK COPOLYMERS

Markus Matzner, Edison, James E. McGrath, Somerville, and Allen Noshay, East Brunswick, N.J., assignors to Union Carbide Corporation, New York, N.Y.

No Drawing. Filed Feb. 1, 1971, Ser. No. 111,703
Int. Cl. C08g 41/04
U.S. Cl. 260—857 G 37 Claims

Block copolymers are prepared from lactam monomer and vinyl polymer having the structure



wherein X_1, X_2, X_3 and X_4 are selected substituent groups, T and T' are selected terminal groups and m is a whole number of about 16 to 100,000. The polymers are prepared in a lactam anionic polymerization reaction using an alkaline catalyst and the vinyl polymer as an activator or initiator.

3,770,850
BIS(POLYPHENYLENE OXIDE)-URETHANE BLOCK COPOLYMERS

Dwain M. White, Schenectady, N.Y., assignor to General Electric Company

No Drawing. Original application Jan. 5, 1970, Ser. No. 817, now Patent No. 3,703,564. Divided and this application Feb. 2, 1972, Ser. No. 222,988
Int. Cl. C08g 41/04
U.S. Cl. 260—858 8 Claims

The invention relates to block copolymers of the A–B–A type where each A is the phenoxy residue of a poly(2,6 - disubstituted-1,4-phenylene oxide) having one terminal hydroxyl per polymer molecule and B is the residue of a compound having two groups which are reactive with the hydroxyl group of said poly(phenylene oxide). These compositions are useful in producing molded articles, films, fibers, etc., having modified properties compared to the parent poly(phenylene oxides).

3,770,851
TERPOLYMER LATICES BASED ON VINYL ETHER/VINYL CHLORIDE COPOLYMERS GRAFTED WITH ACRYLATE ESTERS

Nathan D. Field, Allentown, and Wiley Edgar Daniels, Easton, Pa., assignors to GAF Corporation, New York, N.Y.

No Drawing. Filed Mar. 30, 1971, Ser. No. 129,641
Int. Cl. C08f 15/40
U.S. Cl. 260—884 11 Claims

Novel terpolymer latices are disclosed which are grafted terpolymers in which poly (alkyl acrylate) or poly (alkylmethacrylate) chain segments are pendant from a backbone composed of a copolymer of vinyl chloride and alkyl vinyl ethers.

Certain of these terpolymers have been found to form clear, strong films useful for coatings upon substrates such

as wood, glass, metal, paper, etc. Other latices within the scope of the invention which are not film forming have been found to be excellent processing aids for polyvinyl chloride extrusion and casting. A method is disclosed for preparing these terpolymers.

3,770,852

POLYOLEFIN RESIN BLENDS

Jerome E. Hager, Decatur, and John I. Eisenhauer, Tuscola, Ill., assignors to National Distillers and Chemical Corporation, New York, N.Y.

No Drawing. Filed Apr. 12, 1966, Ser. No. 541,978
Int. Cl. C08f *37/18*
U.S. Cl. 260—897 B **4 Claims**

Polyolefins having broad polymodal molecular weight distribution and improved environmental stress crack resistance are prepared by catalytically polymerizing an olefin, e.g. ethylene or a mixture of ethylene and vinyl acetate in a first reaction region, passing the resulting reaction product to a second reaction region into which a second olefin gas stream is fed and polymerized and blending the polymerization product from said second reaction region with a ethylene-vinyl acetate copolymer.

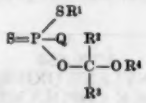
3,770,853

PROCESS FOR PRODUCING THIOPHOSPHORIC ACID TRIESTERS

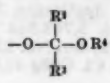
Erich Ruf, Essen, Germany, assignor to Th. Goldschmidt A.G., Essen, Germany

No Drawing. Filed July 6, 1971, Ser. No. 160,144
Claims priority, application Germany, July 9, 1972, P 20 33 987.1
Int. Cl. C07f *9/16*
U.S. Cl. 260—981 **8 Claims**

This invention relates to a process for producing mixtures of dithiophosphoric acid triesters and trithiophosphoric acid triesters of the general formula:



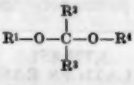
in which Q is the group —SR^1 or



R^1 and R^4 are selected from the group consisting of alkyl and aryl groups, and

R^2 and R^3 are selected from the group consisting of hydrogen and alkyl and aryl groups,

by reacting phosphorus pentasulfide at a temperature in the range of about 80 to about 110° C. and in a molar ratio of 1:≧3 with a compound having the Formula I:



in which R^1, R^2, R^3, and R^4 are as given above.

3,770,854

PROCESS FOR PREPARING PHOSPHOROTHIONYL DISULPHIDES

Arthur Leslie Morris, Didcot, Terence Colclough, Wantage, and Ronald Brookes, Drayton, England, assignors to Esso Research and Engineering Company

No Drawing. Filed Mar. 23, 1971, Ser. No. 127,337
Claims priority, application Great Britain, Mar. 31, 1970, 15,187/70
Int. Cl. C07d *105/04*; C07f *9/16*
U.S. Cl. 260—985 **6 Claims**

Phosphorothionyl disulphides useful as ashless lubricating oil additives (antioxidant, anti-wear and extreme pressure additives) are prepared by reacting a thiophosphoric acid with an organic compound containing the group >S=O (e.g. a sulphoxide), preferably at a temperature lower than 140° C.

3,770,855

PROCESS FOR PRODUCING PHOSPHATE ESTER SURFACE ACTIVE COMPOSITIONS

Albert Benson, Fairlawn, Marvin Mausner, Teaneck, and William Carasik, Ridgewood, N.J., assignors to Witco Chemical Company, Inc., New York, N.Y.

No Drawing. Filed Dec. 15, 1967, Ser. No. 690,731
Int. Cl. C11d *3/36*; C07f *9/08*
U.S. Cl. 260—987 **2 Claims**

Phosphoric acid ester compositions prepared by phosphorylating a nonionic surface active agent selected from the group consisting of hydroxylic organic compounds containing at least 6 carbon atoms and a reactive hydrogen atom, alkylene oxide adducts of said hydroxylic organic compounds substantially free of polyglycol by-products and mixtures thereof and then hydrolyzing the phosphate ester with at least about 0.5% weight of water exhibit substantially improved product color and clarity and resistance to discoloration and acid drift in storage. The products so produced are useful in liquid detergents and dry-cleaning compositions.

3,770,856

PRODUCTION OF FINE FIBROUS STRUCTURES

Shiro Ueki and Tadayuki Fukada, Yokkaichi, Japan, assignors to Kabushiki Kaisha Oji Yuka Goseishi Kenkyujo, Tokyo-to, Japan

No Drawing. Filed Sept. 3, 1971, Ser. No. 177,865
Claims priority, application Japan, Sept. 8, 1970, 45/78,156
Int. Cl. B29c *23/00*
U.S. Cl. 264—13 **10 Claims**

An aqueous emulsion containing a linear polymer and a solvent positive relative to the polymer is ejected from a region at a temperature higher than that at which the polymer is at least caused to swell in the emulsion but lower than the critical temperature of the emulsion, and at a pressure higher than the saturated vapor pressure of the emulsion, into a low-pressure region at a temperature and pressure enabling the liquid phase which has infiltrated into fluid droplets of the polymer in the emulsion to vaporize, thereby producing a fine fibrous structure. The weight ratio of the solvent to the polymer is greater than unity, and the droplets contain a water-sorption agent in a quantity of from zero to 80 percent of the weight of the polymer.

3,770,857

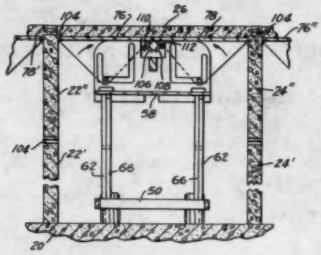
METHOD FOR ERECTING POURED CONCRETE STRUCTURES

John F. Haws, St. Davids, Pa. (% Stonorov and Haws, 2207 Chestnut St., Philadelphia, Pa. 19103)

Original application Aug. 7, 1970, Ser. No. 62,007, now Patent No. 3,659,977, dated May 2, 1972. Divided and this application Oct. 18, 1971, Ser. No. 190,153
Int. Cl. B28b *1/14*
U.S. Cl. 264—33 **4 Claims**

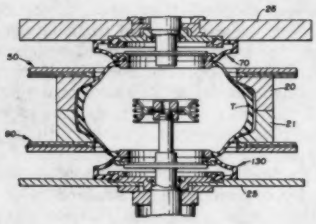
A method of casting concrete wherein a slab is provided at the construction site, a pair of internal molding forms mounted on a roadable chassis are positioned on the site to cooperate with external forms to form vertical parallel, spaced walls. The internal forms are also provided with projections to form apertures in the cast concrete whereby the molding forms and chassis may climb the walls to position the internal forms to permit sequential casting of further vertical wall sections. The internal forms are rotated to a horizontal position to

permit pouring of a roof and floor section and the apparatus is lowered to the slab. The apertures in the vertical



walls also provide a means to interlock with the cast horizontal sections.

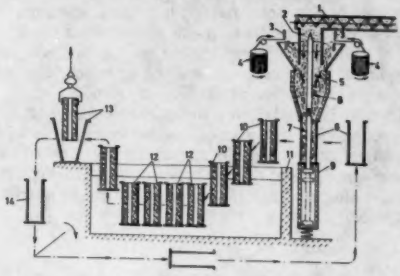
3,770,858
METHOD FOR RETREADING TIRES
Newell J. Ireland, Akron, and Gary R. Getz, Norton, Ohio, assignors to McNeil Corporation, Akron, Ohio
Filed Sept. 10, 1971, Ser. No. 179,308
Int. Cl. B29n *5/04*
U.S. Cl. 264—36 **5 Claims**



A method for manipulating and curing a tire having at least the tread renewed including inserting the tire in mold sections having an internal diameter in the tread area substantially the same as the external diameter of the tread portion of the tire by engaging the beads of the tire with bead ring portions of the extended bladder assemblies to center the tire between the mold sections, inflating the tire to partially retract the bead rings thereby displacing the beads of the tire outwardly to reduce the external diameter of the tread portion of the tire, encapsulating the tire within the mold by extending the mold sections to the closed position while maintaining the beads of the tire displaced outwardly, and bringing the bolsters into contact with the mold sections to return the beads of the tire to their original position before curing.

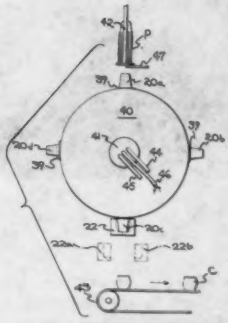
3,770,859
BUILDING MATERIALS
Christopher Graham Bevan, London, England, assignor to C. G. Bevan Associates Limited, London, England
Filed June 29, 1971, Ser. No. 158,030
Claims priority, application Great Britain, July 7, 1970, 32,917/70; Nov. 2, 1970, 52,031/70
Int. Cl. B28b *1/08, 1/52*
U.S. Cl. 264—71 **18 Claims**

A method of making building products, primarily panels, which products have at least one bore extending therethrough wherein a substantially dry mixture of a liquid setting powder and a fibrous constituent is introduced to a mould having bore-forming means therein, the mixture is compacted and the bore-forming means with-



drawn, then liquid for setting the powder is allowed to seep through the mixture with said at least one bore serving as flow path means for facilitating flow of the liquid through the mixture.

3,770,860
METHOD FOR FORMING THIN-WALLED PLASTIC CONTAINER
Stephen W. Amberg, St. James, N.Y., Ralph G. Amberg, Monticello, Ind., and Rodney E. Ludder, Glen Head, N.Y., assignors to Owens-Illinois, Inc.
Continuation of abandoned application Ser. No. 842,839, July 18, 1969. This application Mar. 3, 1972, Ser. No. 231,734
Int. Cl. B29c *17/04, 17/07*
U.S. Cl. 264—89 **5 Claims**



Method is provided for forming a nestable preform or blank of polystyrene, polyethylene, polypropylene, polyvinyl chloride or the like into a blow molded thin-walled container having one of a variety of shapes and which, generally, is not nestable. Method is utilized so that the nestable preform can be supplied to the end user, namely, the packer, from the manufacturer in a package containing several hundred preforms in stacked, nested relationship. Such preforms are denested and placed individually in a mold having a cavity contoured to the desired configuration of the finished article. Upon

heating to the desired temperature, the preform is expanded within the mold into conformity with the molding cavity. In a preferred embodiment, the preform is heated while it is retained on a mandrel by vacuum applied to the mandrel, thereby retaining all portions of the preform snugly against the mandrel during the heating step. After being enclosed within a blow mold, the preform is expanded by blow air introduced through the mandrel. It has been found that such retention, heating and blowing procedures make it possible to apply printing or other decorating indicia to the preform, and the preprinted final container will be commercially satisfactory upon completion of the blowing step.

Thus, it is possible for the packer either (1) to utilize as a container the printed, nestable preform which he purchases from the preform manufacturer or (2) to convert the purchased, printed, nestable preform into a differently shaped, similarly printed, normally non-nestable container.

3,770,861

SUPER-DRAWING POLYESTER FILAMENTS AFTER APPLICATION OF A DI-ESTER OF A POLYALKYLENE GLYCOL

Yutaka Hirano, Tadayuki Yamane, and Syozi Matsumoto, Kurashiki, Japan, assignors to Kuraray Co., Ltd., Kurashiki City, Okayama Prefecture, Japan

Filed Nov. 19, 1970, Ser. No. 90,931

Claims priority, application Japan, Nov. 22, 1969, 44/93,741; Dec. 25, 1969, 44/1,097

Int. Cl. B29c *17/02*

U.S. Cl. 264—130 **2 Claims**

When a melt-adhesion preventing agent selected from compounds expressed by the following Formulas 1 to 4 is applied to substantially amorphous, melt-spun, undrawn synthetic linear polyester filaments in an amount of at least 0.05% by weight based on the weight of the filaments, and then the filaments are super-drawn, melt-adhesion among filaments, which is inevitably caused to occur in conventional super-drawn methods, can be completely prevented:

$$R_1-\overset{\overset{O}{\|}}{C}-O-A-H \quad (1)$$

$$R_2-\overset{\overset{O}{\|}}{C}-O-A-\overset{\overset{O}{\|}}{C}-R_2 \quad (2)$$

$$R_1-O-A-H \quad (3)$$

and

$$R_1-O-A-\overset{\overset{O}{\|}}{C}-R_2 \quad (4)$$

3,770,862

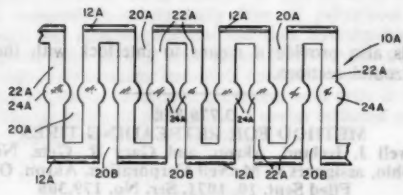
METHOD OF MAKING A STRINGER FOR A SLIDE FASTENER

Fred H. Rojahn, 107 Jefferson Terrace, Springfield, N.J. 07081

Original application Oct. 8, 1970, Ser. No. 79,123. Divided and this application Jan. 27, 1972, Ser. No. 221,195

Int. Cl. B29d *5/00*

U.S. Cl. 264—148 **7 Claims**



A method of making a stringer blank for a slide fastener having an extruded elongated body provided with transversely spaced slider guide members projecting outwardly from one side thereof adjacent to the longitudinal edge portions of the body, and abutment members projecting outwardly from the opposite side thereof. Forming a plurality of longitudinally spaced slots in the stringer blank to provide a series of transverse, substantially parallel ladder-like portions, wherein each of these portions includes a centrally enlarged element to define an interlocking head member. Preferably, the slots are alternately cut through the opposing longitudinal edges of the blank. Folding the stringer blank in half with one guide member overlying the other guide member, and with the abutment members contacting each other to define a stringer provided with a series of projection elements having the interlocking head member at the free end thereof and an open receiving slot at the opposite end thereof. The receiving slot is adapted to house the tape or fabric to which the stringer is attached by conventional stitching. The abutment members position the fabric relative to the interlocking head member to provide a uniform spacing therebetween. The receiving slot may be provided with an enlarged recess to receive an elongated bead formed on the edge of the fabric.

3,770,863

METHOD FOR FORMING COMPOSITE BUILDING ELEMENTS

Reinhold Magnus Elgenstierna, Stockholm, Sweden, assignor to Tegelindustriens Centralkantor AB, Stockholm, Sweden

Filed Aug. 17, 1971, Ser. No. 172,405

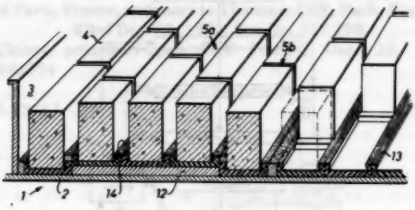
Claims priority, application Sweden, Aug. 20, 1970, 11,385/70

Int. Cl. B32b *31/06*

U.S. Cl. 264—261 **5 Claims**

A method and carrier members for the formation of building elements of the type having a plurality of bricks,

tiles or stones joined together by a binder. A plurality of carrier members, having slightly elastic side edges partially surrounding the side edges of bricks inserted into said carrier members, are positioned in a mold in their ultimate relationship as in the completed building element. Thereafter a bonding material is filled into the spaces defined between said carrier members to form the completed building element. In this way said carrier members may be filled before their arrangement in the mold and are thus also usable as a transporting package.



3,770,864

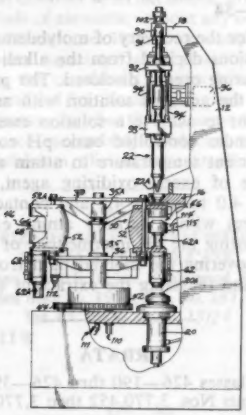
METHOD FOR PRODUCING RUBBER AND LIKE MOLDED ARTICLES

Luigi Bertrandi, Via Peano 11, Turin, Italy

Original application Oct. 28, 1968, Ser. No. 771,059, now Patent No. 3,621,533. Divided and this application Nov. 19, 1971, Ser. No. 200,637

Int. Cl. B29h *3/08*

U.S. Cl. 264—268 **10 Claims**



An apparatus which includes a plurality of molds which open and close, means for closing the molds, for holding them closed under a first pressure or force, and for moving them into registry with a clamping station where a second, much greater force or pressure may be applied, while a charge of article-forming material is forced into the molds, one at a time, as they are brought into position, and means for maintaining the lower force on the molds after the material has been introduced into the molds, whereby only one high force cylinder assembly is needed for a plurality of molds, since each mold requires a high force to remain closed only during a short period within a molding and vulcanizing cycle. The process is particularly described with respect to a hydraulically operated machine in which molding is by way of injection of rubber into mold units mounted on a turntable so as to permit free but limited axial movement, to simplify operation of the clamping and high force-applying steps, and continuous operation.

3,770,865

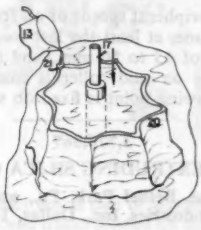
METHOD FOR FORMING WATER CANDLES

James Allen Ralles, 795 Alma St., Palo Alto, Calif. 94301

Filed Jan. 17, 1972, Ser. No. 218,147

Int. Cl. B29c *5/00*

U.S. Cl. 264—279 **4 Claims**



A method for forming water candles and other decorative enclosures starting with an elongate candle stem or other stem support formed with an enlarged base. According to the method the bottom of the candle stem base is immersed in a container of water or other cooling fluid medium and a molten thermoplastic material is poured onto and around the enlarged base so that it runs off the base onto the surface of the water forming a substantially horizontal film over the surface of the water surrounding and extending from the base. An edge of the film is depressed to permit water from the container to run across the top of the film and cool and thereby harden molten thermoplastic material on the top of the film around the candle stem. The candle stem is gradually depressed into the container of water while pouring molten thermoplastic material around the perimeter of the hardened film which extends substantially horizontally from the candle base thereby initiating the formation of a substantially vertical sidewall around the candle stem. During pouring of the sidewall, a hole is formed adjacent the bottom of the wall to permit water to enter around the stem of the candle. The candle stem is further depressed while pouring molten thermoplastic material around selected portions of the perimeter until the wall is formed to desired height and the material has cooled and hardened.

3,770,866

DRAWING POLYESTER FILAMENTS USING AS A SNUBING MEANS A HEATED ROLLER DRIVEN AT THE FEED RATE SPEED

Kaoru Sakata, Yosiharu Asada, and Yasuhiro Okamura, Matsuyama, Japan, assignors to Teijin Limited, Osaka, Japan

Continuation-in-part of abandoned application Ser. No. 6,733, Jan. 29, 1970. This application Jan. 4, 1972, Ser. No. 215,383

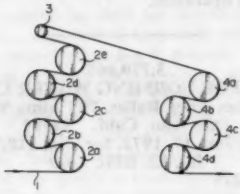
Claims priority, application Japan, Feb. 3, 1969, 44/7,992

Int. Cl. B29c *17/02*

U.S. Cl. 264—290 T **12 Claims**

A process for drawing polyester filaments which comprises drawing undrawn filaments of polyester containing

at least 85 mol percent of ethylene terephthalate units between plural, heated feed rollers and at least one drawing roller rotating at a peripheral speed higher than that of the feed rollers, the improvement residing in the features that the peripheral speeds of all feed rollers are substantially the same, at least the last feed roller is given a small diameter of 15 to 50 mm., and the arc of contact of the filaments on said roller is made at least 180°, whereby the drawing point is fixed on said roller.



3,770,867

METHOD OF EXTRUDING SILICA COMPOSITIONS

George H. Criss, Bethel Park, Pa., assignor to Dresser Industries, Inc., Dallas, Tex.

No Drawing. Original application Mar. 18, 1970, Ser. No. 20,859, now abandoned. Divided and this application Nov. 19, 1971, Ser. No. 200,621

Int. Cl. B28b *3/20;* **C04b** *25/00, 27/04*
U.S. Cl. 264—294 **3 Claims**

An extrudable coarse silica composition comprising fused or vitreous silica, volatilized silica, and a plasticizing organic binder. A method for rendering coarse fused or vitreous silica extrudable comprising adding thereto volatilized silica and a plasticizing organic binder.

ERRATUM

For Class 264—294 see:
Patent No. 3,770,458

3,770,868

PROCESSING OF MANGANESE ORES

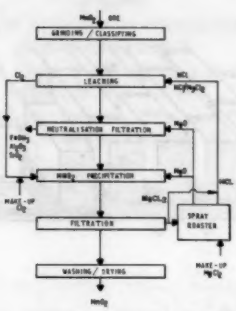
Dominicus Adrianus Johannes Swinkels and Peter Hansen Scaife, Charlestown, New South Wales, and John Barry Lean, North Lambton, New South Wales, Australia, assignors to The Broken Hill Proprietary Company Limited, Newcastle, New South Wales, Australia

Filed Dec. 13, 1971, Ser. No. 207,279

Claims priority, application Australia, Dec. 30, 1970, 3,605/70

Int. Cl. C01g *45/02;* **H01b** *1/08*
U.S. Cl. 423—50 **6 Claims**

Synthetic manganese dioxide is produced by leaching a manganese dioxide ore with hydrochloric acid in the presence of manganese chloride or magnesium chloride, precipitating manganese dioxide using chlorine liberated in the leaching step, and hydrolysing the liquid phase remaining after separation of the product to regenerate a base used for pH control earlier in the process and the acid used in the leaching step.



3,770,869

RECOVERY OF MOLYBDENUM

Tai K. Kim, L. Rita Pagnozzi, Martin B. MacInnis, and John M. Laferty, Towanda, Pa., assignors to GTE Sylvania Incorporated

Filed May 19, 1972, Ser. No. 255,010

Int. Cl. C01g *39/00*
U.S. Cl. 423—54 **5 Claims**

A process for the recovery of molybdenum values from aqueous solutions derived from the alkali fusion of molybdenum bearing ores is disclosed. The process involves treatment of the aqueous solution with an excess of an oxidizing agent to achieve a solution essentially free of sulfide ions under controlled basic pH conditions, heating to a sufficient temperature to attain a solution substantially free of excess oxidizing agent, adjusting the pH to about 4.0 to about 4.5 and contacting in a plurality of stages with a tertiary amine extractant solution, and adjusting the pH intermediate of the stages and thereafter recovering the molybdenum from the extractant solution and recycling the extractant solution.

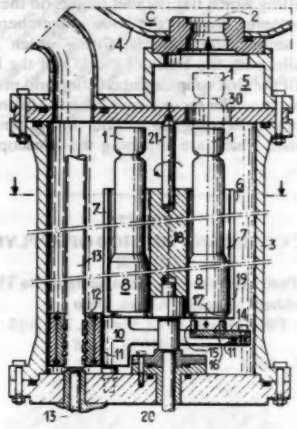
ERRATA

For Classes 426—190 thru 426—394 see:
Patents Nos. 3,770,452 thru 3,770,457

For Classes 426—8 thru 426—212 see:
Patents Nos. 3,770,459 thru 3,770,463

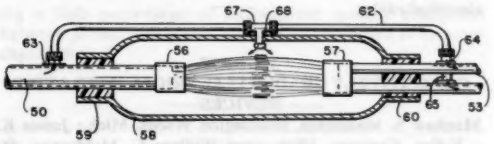
ELECTRICAL

3,770,870
TURRET DEVICE FOR POSITIONING CRUCIBLES IN ION SOURCES
Jacques Kervizic; Rene Masic, and Robert Jean Warnecke, all of Paris, France, assignors to Thomson-CSF, Paris, France
Filed Dec. 22, 1972, Ser. No. 317,790
Claims priority, application France, Dec. 23, 1971, 71046394
Int. Cl. H01j *39/26*
U.S. Cl. 13—31 **7 Claims**



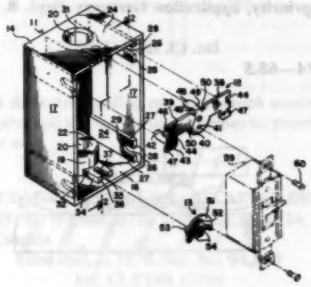
Turret device making it possible to successively introduce, in the ionization chamber of an ion source, crucibles containing different kinds of elements, without any need to interrupt the operation of the source. This device comprises a detachable rotatable barrel associated with cylindrical support-members 8 carrying the crucibles 1, means being provided for rotating the barrel and for translating any one of the crucibles toward the ionization chamber C. This turret device is suitable for an ion source successively producion ions of arsenic, phosphorus, aluminium, silicium, for example.

3,770,871
PRESSURIZED CABLE SYSTEM WITH LOWER PRESSURE SPLICE CASE
Jack P. Goodman, 2500 S. Tejon, Englewood, Colo.
Filed May 26, 1972, Ser. No. 257,132
Int. Cl. H02g *15/26, 15/24*
U.S. Cl. 174—11 R **1 Claim**



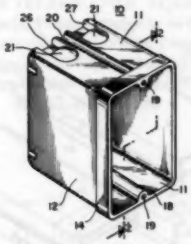
The conduit or covering of a pressurized cable system is dammed on both sides of a splice, and a by-pass conduit provides a pressure system around the splice. A covering or case over the splice is pressurized from the by-pass to a lesser pressure than that in the main conduit, but still providing a moisture proof covering for the splice.

3,770,872
ELECTRICAL OUTLET BOX CONSTRUCTION
Leland A. Brown, Huntington Station, N.Y., assignor to Electrical Fittings Corp., East Farmdale, N.Y.
Filed Nov. 17, 1971, Ser. No. 199,581
Int. Cl. H02g *3/08*
U.S. Cl. 174—53 **12 Claims**



An electrical outlet box is cast of aluminum or other soft metal and has grooved tracks formed on the top and bottom inside faces of its side walls and the medial inside faces of the top and bottom end walls. One form of mounting bracket includes a front mounting plate and three rearwardly projecting tongues which slideably engage the track grooves and are locked in position by shearing portions of the groove side walls and bending them into engagement with shoulders on the tongues. The mounting plate has an opening for guiding a tool to the groove wall front face. In another form the bracket includes a medial stepped tongue providing a vertical shoulder and the groove side walls are deformed to engage the shoulder edges and a top face of the tongue outer stepped portion.

3,770,873
PLASTIC ELECTRICAL JUNCTION BOX
Leland A. Brown, Huntington Station, N.Y., assignor to Electrical Fittings Corporation, East Farmsdale, N.Y.
Filed Nov. 17, 1971, Ser. No. 199,587
Int. Cl. H02g *3/08*
U.S. Cl. 174—58 **11 Claims**



An electrical junction box is integrally molded of a synthetic organic plastic and includes rectangular side, rear and end walls defining a cavity for receipt of an electrical fixture and is open at its front. A pair of laterally spaced knock-out plugs are located on each end wall forwardly of its rear edge and each plug is delineated by front and side lines of weakness and a rear slot. A recess with parallel tool guiding side faces extends from each slot to the rear wall, the recess front edge being the slot rear edge and being downwardly rearwardly offset from

the slot front edge. Integrally formed blocks extend along the inside corners between the rear wall and the end walls and have rear horizontal grooves with restricted throats oblique to the box rear face.

3,770,874

CONTACT MEMBERS FOR SOLDERING ELECTRICAL COMPONENTS

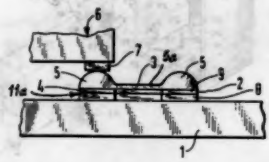
Friedrich Krieger, Gilching; Oskar Wirbser, Unterpfaffenhofen, and Albert Pfeiffer, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Sept. 7, 1971, Ser. No. 178,168

Claims priority, application Germany, Sept. 8, 1970, P 20 44 494.4

Int. Cl. H05k *1/00*

U.S. Cl. 174—68.5 **5 Claims**



Contact members for soldering components to a circuit means or wiring boards, wherein the components include semiconductors, integrated or hybrid circuits such as flip-chip circuit for assembly by reflow-solder methods. A contact member comprises at least two equal geometric areas interconnected by a narrow bridge. In preferred embodiments the contact members are composed of a base gold layer overcoated with a nickel layer.

3,770,875

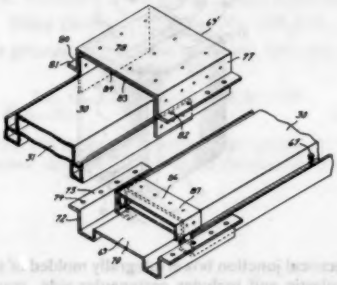
TOTALLY ENCLOSED CABLEBUS

Elmer T. Carlson, P.O. Box 18, West Granby, Conn.

Continuation-in-part of Ser. No. 848,541, Aug. 8, 1969, Pat. No. 3,614,297, which is a division of Ser. No. 80,609, Oct. 14, 1970, Pat. No. 3,644,663, and a continuation-in-part of Ser. No. 769,485, Oct. 22, 1968, Pat. No. 3,504,097. This application Aug. 16, 1971, Ser. No. 172,012. The portion of the term of this patent subsequent to Mar. 31, 1987, has been disclaimed.

Int. Cl. H02g *15/08*

U.S. Cl. 174—88 B **8 Claims**



A cablebus housing which has telescoping U-shaped members adapted to separate to thread insulated conductors through the housing and to contract to engage opposed faces of the conductor insulation, which are preferably octagonal in cross section to aid in heat conductivity away from the insulation. The housing has a coupling half of one type protruding from one end and adapted to cooperate with a coupling half of another type on another housing or fitting, and it has a coupling half of the other type protruding from the other end and adapted to cooperate with another housing or fitting. The telescoping housing members are moved from their expanded to their contracted positions by clamping screws, which preferably engage diverging flanges on the sides of the telescoping U-shaped members.

In some cases the housing cooperates with a fitting having a coupling half of either type suitable to couple with the housing, and having a transverse flange at the end provided with an opening through which the conductors can run. The fitting also has telescoping U-shaped members which extend from the flange less than the length of the coupling half.

In some embodiment the housing is connected to a first supplemental fitting which has parallel prongs on the side adjoining the telescoping arms of the housing members and which contacts a second supplemental fitting which has parallel prongs parallel with the bases of the U's of the housing and adapted to fit the first supplemental fitting and provide access to the conductors. The second supplemental fitting at the end removed from the housing has parallel prongs similar to those first mentioned which are adjoining the telescoping sides of the housing.

3,770,876

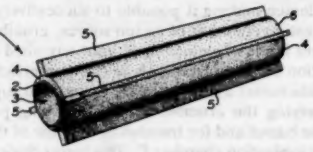
ELASTIC COVER AND METHOD OF APPLYING SAID COVER

Herman B. Post, Wapakoneta, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 8, 1972, Ser. No. 251,615

Int. Cl. H02g *15/08*

U.S. Cl. 174—88 R **19 Claims**



An elastic cover for disposition over supporting members or work pieces and a method of applying the cover thereover. The cover is a hollow tube of highly expandable elastomeric material which includes gripping means such as longitudinal ribs provided on its outer surface so that the tube may be expanded by outwardly directed forces acting on the ribs. The tube, before expansion is incapable of positioning over the member but after expansion, the tube is capable of positioning over the member and upon contraction, firmly grips the member to provide a tight fitting cover thereover. The invention is particularly useful for sealing splice or repair areas of electrical cables.

3,770,877

CAPACITIVELY GRADED ELECTRICAL INSULATING DEVICES

Matthew S. Mashikian, Huntington Woods, Mich.; James K. Kelley, Carleton, Mich., and William C. McMurray, St. Clair Shores, Mich., assignor to the Detroit Edison Company, Detroit, Mich.

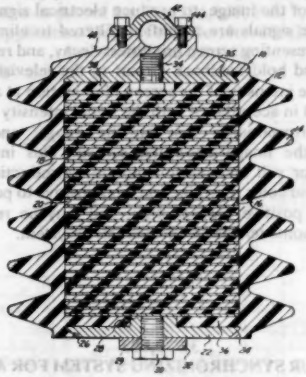
Continuation-in-part of Ser. No. 86,709, Nov. 4, 1970, Pat. No. 3,673,305. This application Apr. 14, 1972, Ser. No. 243,975

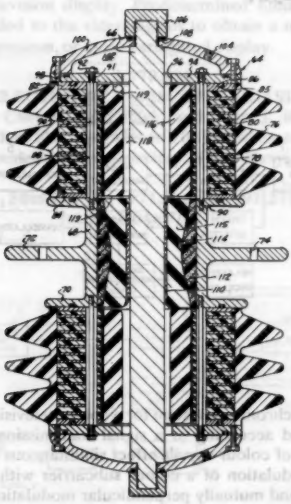
Int. Cl. H01b *17/28;* **H01g** *3/135, 7/04*

U.S. Cl. 174—143 **43 Claims**

Capacitively graded electrical insulating devices, preferably modular, designed as insulators, bushings, and lightning ar-

restors. Plates are assembled with linear spacing and with specially compounded dielectric material of epoxy resin containing a high percentage of ferroelectric powder interposed between plates, with plates electrically connected to increase capacitance.





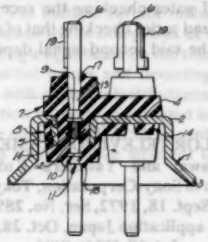
3,770,878

HERMETICALLY SEALED ELECTRICAL TERMINAL

Hilliard Dozier, Cincinnati, Ohio, assignor to U.S. Terminals, Inc., Cincinnati, Ohio

Filed Dec. 6, 1971, Ser. No. 204,855
Int. Cl. H01r *9/16*; H01b *17/26*
U.S. Cl. 174—153 R **14 Claims**

A hermetically sealed electrical terminal in which one or more highly conductive conductor pins, formed from materials such as copper and copper alloys, are electrically insulated from a supporting member, such as a metallic shell, by means of a molded dielectric sealing member which coacts with the conductor pins and the supporting member to provide a reliable hermetic seal.

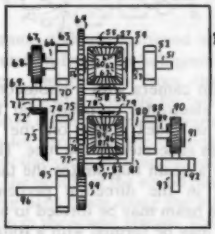


3,770,879

ROTARY MECHANICAL TRANSLATING DEVICE

Thomas A. W. K. Watson, 2720 Goyer St., Apt. 24, Montreal, Quebec, Canada

Filed Dec. 3, 1970, Ser. No. 94,819
Int. Cl. F16h *37/06*
U.S. Cl. 74—682 **8 Claims**



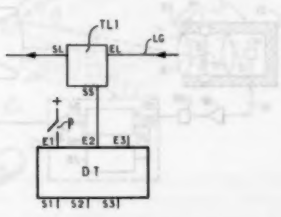
A rotary mechanical translating device may be defined as a purely mechanical device which transfers power from a prime mover to a load as a magnified function of a displacement at its input connection. The device exhibits a power gain and may be employed to produce mechanical amplification. A change in angular velocity of its input will result in a change in the angular velocity of its output.

3,770,880

LOGICAL CALL FEE DETERMINATION DEVICE FOR USE WITH TELEGRAPHIC EQUIPMENT

Maurice Lantier, Paris, France, assignor to Compagnie Industrielle des Telecommunications, Paris, France

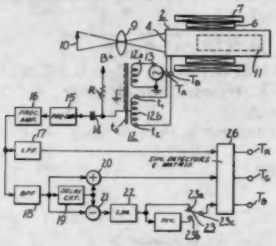
Filed May 15, 1972, Ser. No. 253,013
Claims priority, application France, May 14, 1971, 7117648
Int. Cl. H04l *15/26*
U.S. Cl. 178—2 F **13 Claims**



A logic device for telegraphic call charge enabling or not enabling. The starting of the charging is dependent on the

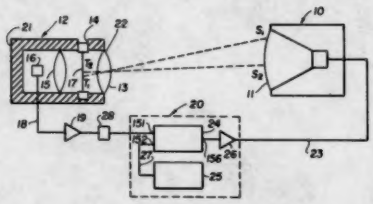
receipt of two successive signals; the first signal being a pulse having a determined length, the second signal being a character of the international code No. 2. The logic device comprises two series of gates establishing time references, the first series of said gates checking the reception of the first signal and the second series checking that of the second signal, the reception of the said second signal depending on that of the first.

3,770,881
COLOR TELEVISION CAMERA
Hiromichi Kurolawa, and Yasuharu Kubota, Kanagawa, Japan, assignors to Sony-Corporation, Tokyo, Japan
Filed Sept. 18, 1972, Ser. No. 289,586
Claims priority, application Japan, Oct. 28, 1971, 46/85880
Int. Cl. H04n 9/06
U.S. Cl. 178—5.4 ST **8 Claims**



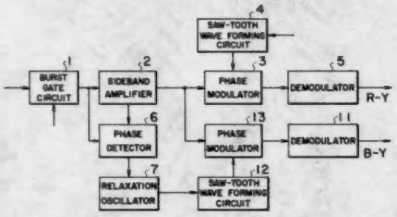
A color television camera with a photoconductive pickup tube having strip electrodes perpendicular to the scanning lines to impress an index signal on the luminance and chrominance signals generated by the tube. The tube includes means to generate a beam that strikes the target with a spot that is elongated in the direction perpendicular to the scanning lines. The beam may be formed to have an elliptical cross-section or it may be formed with a round cross-section and then distorted to have an elliptical cross-section or deflected very rapidly and for only a short distance to create the effect of an elliptical cross-section. The length of the ellipse is preferably greater than twice the distance between successively scanned lines.

3,770,882
VIDEO REPRODUCTION SYSTEM FOR PHOTOGRAPHIC AND OTHER IMAGES
Oleg Szymber, Elk Grove, Ill., assignor to GAF Corporation, New York, N.Y.
Continuation-in-part of Ser. No. 162,150, July 13, 1971. This application July 3, 1972, Ser. No. 268,517
Int. Cl. H04n 9/30
U.S. Cl. 178—5.2 A **45 Claims**



An improved system for reproducing transparent photographic and other film images and the images of opaque objects on a television screen is provided in which the television picture tube upon which the image is displayed is utilized as a flying spot scanner to emit pulsating beams to sample the image. Each such beam from the tube is focused upon the image by a suitable lens. A photo-detector is positioned to receive the light from the television tube which passes through or is reflected from the image and is responsive to the intensity of such light, which varies with the optical density or reflectance of the image, to produce electrical signals related thereto. The signals are amplified, filtered to eliminate that portion representing screen brightness decay, and returned via a sample and hold feedback circuit to the television unit to modulate the intensity of the screen illumination at any instantaneous spot in accordance with the signal intensity representing the corresponding spot on the image, and thereby reproduce the image upon the screen. This invention is adaptable for still and motion picture reproduction, black-and-white and color reproduction, and positive to positive and negative to positive reproduction, and may be readily employed in a home television entertainment system.

3,770,883
COLOUR SYNCHRONIZING SYSTEM FOR A PAL COLOUR TELEVISION RECEIVER
Yasaumasa Sugihara, Kawasaki, Japan, assignor to The General Corporation, Kawasaki-shi, Kanagawa-ken, Japan
Filed Feb. 11, 1972, Ser. No. 225,397
Claims priority, application Japan, June 9, 1971, 46/41279
Int. Cl. H04n 9/46
U.S. Cl. 178—5.4 P **7 Claims**



Colour synchronizing system for a colour television receiver is constructed according to a signal transmission system in which a pair of colour signals effect simultaneous quadrature balanced modulation of a colour subcarrier with respect to first and second mutually perpendicular modulation axes, the second of which undergoes phase alternation of 180° for successive horizontal lines and in which the resulting colour television signal includes a colour sync signal rendering it possible to discern the alternating polarities of a chrominance signal. Said colour sync signal includes first and second components carried on the initial part of each horizontal line so as to appear concurrently or in succession and has a phase displacement of 90° to each other, the first component being of a fixed phase, and the second component being of a phase which is periodically switched in a manner corresponding to the phase alternation of the second modulation axis for successive horizontal lines. For demodulation of the chrominance signal along the first modulation axis not undergoing phase alternation, an instantaneous reference subcarrier is used which is obtained by phase modulation, with a saw-tooth wave having a frequency equal to half the line frequency, of an offset subcarrier of a frequency of $f_{SC} \pm 2n - 1/2\ f_H$, where f_{SC} denotes the frequency of a colour subcarrier, f_H, line frequency and n a positive integer.

3,770,884

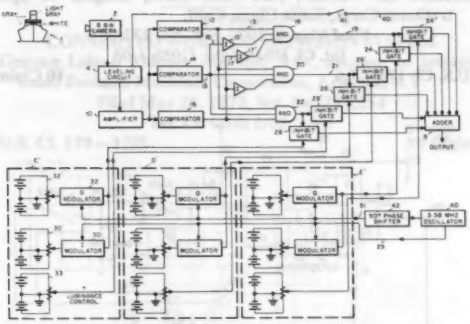
LUMINANCE CONTROL CIRCUIT FOR MULTI-COLOR PERISCOPE VIEW SIMULATOR

William J. Curran, Orlando, and John J. Kulik, Winter Park, both of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 224,165, Feb. 7, 1972. This application May 4, 1972, Ser. No. 250,219

Int. Cl. H04n 5/22, 9/04

U.S. Cl. 178—5.4 R 2 Claims



A luminance control circuit is added to circuitry for converting black and white video signals to color information for a color television display. Predetermined luminance values may be added to the video signals to obtain a more realistic, more conspicuous, or more variegated display.

3,770,885

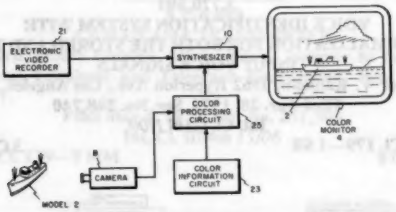
COLOR ELECTRONIC PERISCOPE VIEW SIMULATOR

William J. Curran, Fern Park, and John J. Kulik, Winter Park, both of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 21, 1971, Ser. No. 191,279

Int. Cl. H04n 7/18, 9/04

U.S. Cl. 178—6 2 Claims



In a closed circuit television display portraying models maneuvering against a background, a colored scene is provided for the background from an electronic video recorder (EVR). Images of ships, planes, etc. inserted into the background are derived from the video signals of black and white cameras and are colored electronically.

3,770,886

ONE DIMENSIONAL HOLOGRAPHIC RECORDING OF ELECTRICAL SIGNALS

Horst Kiemle, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

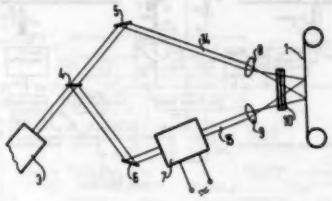
Filed Oct. 27, 1971, Ser. No. 192,832

Claims priority, application Germany, Nov. 13, 1970, P 20 56 025.2

Int. Cl. H04n 5/84; G02b 27/00

U.S. Cl. 178—6.7 R 20 Claims

The present invention is directed to a method of recording information, which is in the form of electrical signals, on a storage medium by simultaneously exposing the light sensitive storage medium with a light beam which is modulated with the electric signals to be recorded and a reference light beam to form a track of information in the form of holograms on the storage medium. The method further includes retrieving the information contained in the holograms of the track of information by projecting a light beam on the track of holograms to form a reconstructed image and detecting the information from the images with a photoelectric transducer which converts the information in the reconstructed images into electrical signals. In one embodiment of the invention, sound signals are recorded in a sound groove adjacent to the information



track of holograms and are retrieved simultaneously with retrieving information from the hologram track of information. To retrieve information from this embodiment, a retrieval apparatus having a needle for retrieving information in the sound groove on an information retrieval head which includes a device for projecting the reading light beam and a photodetector for detecting information retrieved by the reading light beam. The needle of the sound head also functions to guide the reading light beam along the information track as the needle moves in the sound groove. The invention also relates to a storage medium having a sound groove for storing sound signals and an information track of holograms formed on a light sensitive surface thereof.

3,770,887

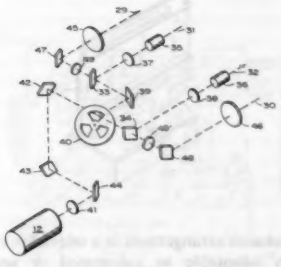
COLOR STEREO TELEVISION

Lyman F. Van Buskirk, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 31, 1972, Ser. No. 222,186

Int. Cl. H04n 9/60

U.S. Cl. 178—6.5 4 Claims



A system of coded discs and mirrors is used with a black and white television system to obtain a colored stereo television picture. No prisms and only one cathode ray tube are used.

3,770,888

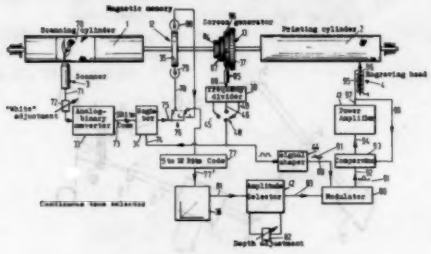
METHOD AND APPARATUS FOR CONTROLLING THE ENGRAVING PATTERN OF AN ELECTROMAGNETIC GRAVURE ENGRAVING

Ferdinand Allard de Vos, Castricum, and Jan Hendrik ter Steege, Breukelen, both of Netherlands, assignors to N.V. Werkspoor-Amsterdam, Amsterdam, Netherlands

Continuation-in-part of Ser. No. 823,389, May 9, 1969, abandoned. This application Oct. 4, 1971, Ser. No. 185,946

Int. Cl. H04n *1/24*

U.S. Cl. 178—6.6 B **10 Claims**



Method and apparatus for electromechanically engraving a pattern of diamond shape dot depressions on the surface of a cylindrical printing form in which the pattern predominantly produces lines of ridges particularly useful for textile printing. The pattern is obtained by engraving along successive, parallel, circumferential engraving line paths at an engraving dot rate per cylinder revolution which causes the placement of dots in adjacent lines to be out of phase with each other by an amount substantially different from 180°. The distance between adjacent lines is related to the width of a dot produced at the maximum engraving depth such that adjacent pairs of dots overlap at such engraving depth and produce, even at lesser non-overlapping depths, a pattern which is predominantly a line pattern, i.e., is essentially lineiform.

3,770,889

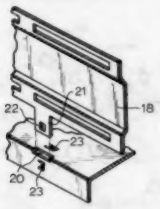
HINGED CHASSIS ARRANGEMENT FOR RECEIVER APPARATUS AND THE LIKE

Lester C. Gutschick, Morton Grove, and Edwin S. Landow, Arlington Heights, both of Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

Filed Mar. 10, 1972, Ser. No. 233,625

Int. Cl. H04b *1/08*

U.S. Cl. 178—7.9 **4 Claims**



A hinged chassis arrangement in a television receiver which is especially adaptable to automated or semi-automated manufacturing and testing techniques. The hinged chassis arrangement utilizes a sub-chassis removably hinged to a principal chassis. During assembly the principal chassis and the sub-chassis are substantially coplanar such that all electrical and mechanical components are mounted from the top into terminal strips extending downwardly through the chassis. After dip-soldering and testing, the sub-chassis is rotated to position upwardly perpendicular to the principal chassis. Component module boards having electrical components mounted thereupon comprising electrical circuits are then affixed to the back of the sub-chassis by female connectors utilizing the extending terminal strips as male connectors.

3,770,890

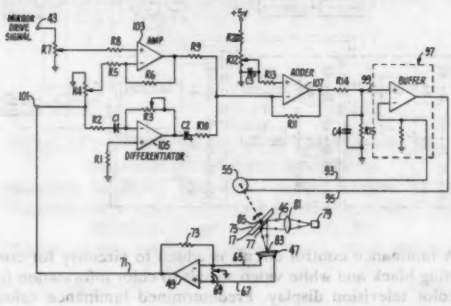
ELECTRONIC SWITCH FOR AN OPERATIONAL AMPLIFIER CIRCUIT

Richard H. Winkler, Palo Alto, Calif., assignor to Spectrotherm Corp., Santa Clara, Calif.

Filed Mar. 6, 1972, Ser. No. 232,034

Int. Cl. H04n *3/00*; G05b *1/06*

U.S. Cl. 178—7.6 **10 Claims**



A technique for controllably supplying current from an operational amplifier to a load wherein the output circuit of the amplifier is connected to ground through a semiconductor switch. The current drawn by amplifier in response to its input signal when its output is connected to ground is then sensed and amplified for driving the load. When the amplifier output circuit is ungrounded by opening the semiconductor switch, the amplifier draws substantially no current and thus current to the load is shut off. An electronic circuit provides a delayed control of the semiconductor switch in the output of the operational amplifier.

3,770,891

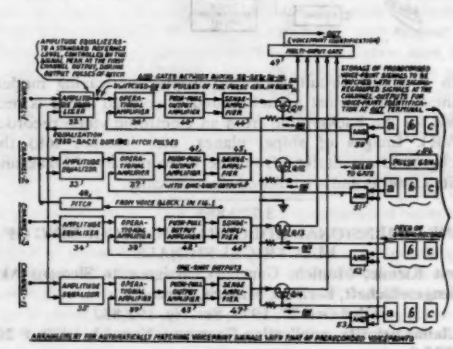
VOICE IDENTIFICATION SYSTEM WITH NORMALIZATION FOR BOTH THE STORED AND THE INPUT VOICE SIGNALS

Meguer V. Kalfaian, 1962 Hyperion Ave., Los Angeles, Calif.

Filed Apr. 28, 1972, Ser. No. 248,740

Int. Cl. G10l *1/00*

U.S. Cl. 179—1 SB **3 Claims**



In an articulated phonetic sound wherein the information bearing group of resonances vary within different frequency regions in the sound spectrum, the detected signals derived

from the group of resonances are constantly regrouped to a reference numerical region along the outputs of a plurality of numerically arranged channels in order that, the signals derived from the varying pitch frequencies are shifted to the output of the first channel (at high speed), while the signals derived from other frequencies are shifted to channel outputs by the same factors of multiplication from the first channel that the original frequencies differ from the pitch frequencies. The mutually related amplitude ratios of significant signals of the regrouped signals are then matched with prerecorded voiceprint signals of the individual to be identified.

3,770,892

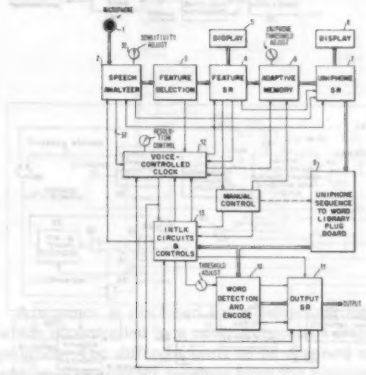
CONNECTED WORD RECOGNITION SYSTEM

Genung Leland Clapper, Raleigh, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 26, 1972, Ser. No. 257,254

Int. Cl. G10l *1/02, 1/16*

U.S. Cl. 179—1 SB **10 Claims**



A system is disclosed which recognizes connected or separate spoken words based on the concatenation of steady state sounds produced by a speaker enunciating a given word for which a definitive array of steady state sounds has previously been entered into the system during a learning period.

3,770,893

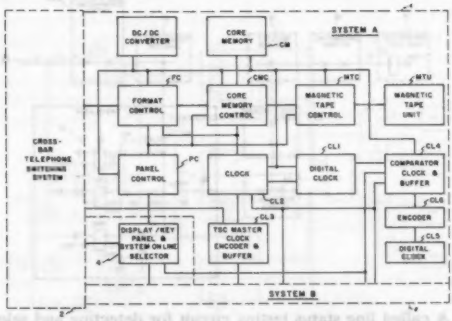
CAMA/LAMA TRANSVERTER

Howard Jeffery Conerly, Milan, Tenn., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed May 8, 1972, Ser. No. 251,306

Int. Cl. H04m *15/06*

U.S. Cl. 179—7 MM **8 Claims**



A system is disclosed for automatically gathering, recording and ticketing billing data for station-to-station telephone calls. The system employs electronic logic circuits which are responsive to signals identifying the calling party and the called party and indicating the status of a call to generate billing data for a finished call in the form of initial entry signals answer/disconnect signals and time signals. The billing data is supplied to a core memory where it is stored. The core memory empties into a tape memory periodically after the recorded data has been checked for accuracy.

3,770,894

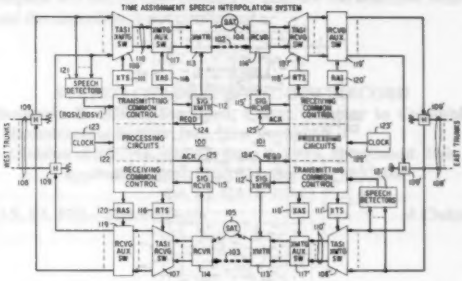
AUTOMATIC TRANSMISSION LINE TESTING SYSTEM

Carl Jerome May, Jr., Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 25, 1972, Ser. No. 291,942

Int. Cl. H04j *5/00*

U.S. Cl. 179—15 BF **15 Claims**



A time assignment speech interpolation system is disclosed utilizing time-shared common control processing circuits. Speech signals from a plurality of trunks are interpolated on a lesser plurality of long-haul transmission channels by connecting trunks only during active periods. In order to detect channel failures rapidly, each channel is automatically tested in a sequence by transmitting a test tone preceded and followed by a silent period. Channel delay is measured during the initial silent period. Transmission gain is measured during the test tone and noise is measured during the terminal silent period. Priority checking is provided for channels about to be restored to service and for channels which have failed once.

3,770,895

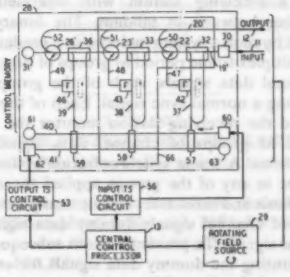
DYNAMICALLY SWITCHING TIME SLOT INTERCHANGER

Roy Stephen Krupp, Rumson, and Lawrence Andrew Tomko, Redbank, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Berkeley Heights, N.J.

Filed Dec. 2, 1971, Ser. No. 204,143

Int. Cl. H04j *3/00*

U.S. Cl. 179—15 AQ **15 Claims**



Selectively actuatable gates establish coupling paths between corresponding stages of two shift registers while at

least one of the registers is being operated in its shifting mode with respect to signals being coupled through such paths. Each register has a full frame of time division multiplex signal storage capacity, and gate selection is accomplished by predetermined control signal patterns in respective control memory loops for the gates. Implementations for discrete device technology and magnetic single-wall domain technology are shown.

3,770,896

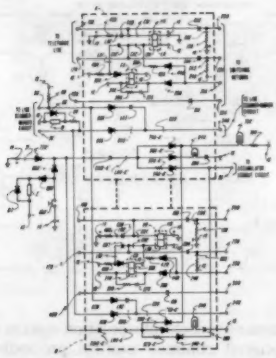
LINE CIRCUIT WITH LOCKOUT

Otto Altenburger, Rochester, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed June 15, 1971, Ser. No. 153,235

Int. Cl. H04q 3/18

U.S. Cl. 179—18 F **17 Claims**



A line circuit for connecting an individual telephone line to a telephone switching network includes a dual coil line relay and a cutoff relay arranged in a balanced line configuration. Under normal off hook conditions, both the line and cutoff relays are operated. In a lockout condition the cutoff relay reminas operated through the off hook telephone. A monitor arrangement is provided for identifying the groups of line circuits that include a line circuit in lockout, for identifying the individual line circuits in lockout, and for providing an alarm signal when a preset number of line circuits are in lockout.

3,770,897

FRAME SYNCHRONIZATION SYSTEM

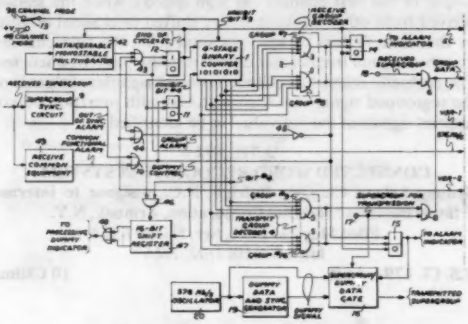
Robert H. Haussmann, Wayne, N.J., and Marvin A. Epstein, Monsey, N.Y., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

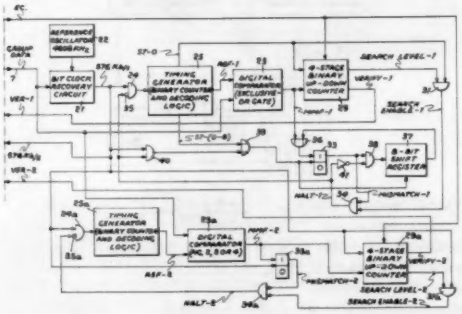
Filed Dec. 6, 1971, Ser. No. 205,093

Int. Cl. H04j 3/06

U.S. Cl. 179—15 BS **21 Claims**

A binary data transmission system employing a sending station and a receiving station with intermediate stations disposed therebetween in tandem. The binary data signal transmitted by such a system includes in a predetermined time division multiplex frame period M groups of time division multiplex channel data signals, each of the groups of channel signals having a normal sync signal. Each of the intermediate stations and the receiving station monitor the received and transmitted M groups of channel data signals on a time sequential basis. A frame synchronization system detects the lack of sync in any of the groups applied thereto on a time sequential basis and substitutes for the thusly detected erroneous group of channel signals dummy data signals including dummy sync signals. To prevent stations subsequent to the stations substituting the dummy data signals for erroneous normal data signals from providing an erroneous error indication and substitution of dummy data for error free normal data signal, the frame synchronization system detects, establishes and maintains sync of each monitored group of channel signals in response to either the normal sync signal or the dummy sync signal. The frame synchronization system pro-





vides a variable search time to establish the desired synchronization to either normal or dummy sync signals for each group of channel data signals coupled thereto.

3,770,898

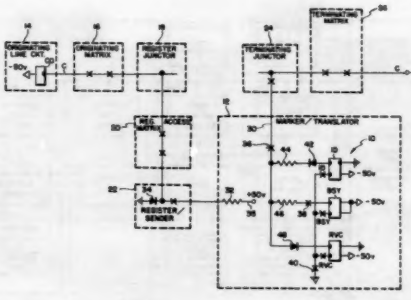
CALLED LINE STATUS TESTING CIRCUIT

John W. Woodward, Schaumburg, Ill., assignor to GTE Automatic Electric Laboratories, Incorporated, Northlake, Ill.

Filed June 5, 1972, Ser. No. 259,642

Int. Cl. H04q 3/48

U.S. Cl. 179—18 AB **5 Claims**



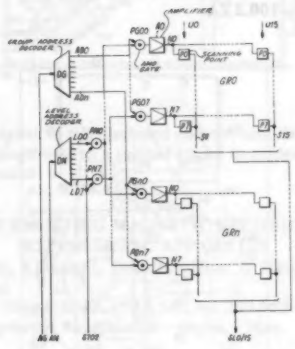
A called line status testing circuit for detecting and selectively responding to the status of a called line in a telephone system, the circuit including three relays and means for detecting either (1) an unassigned terminal; (2) an idle terminal; (3) a busy terminal; or (4) a reverting call condition of the

called line and selectively operating the three relays to indicate the detected line condition, said detecting and indicating operations being performed simultaneously in a single step.

3,770,899
SCANNER FOR A CENTRALLY CONTROLLED TELEPHONE SWITCHING SYSTEM

Stanislas Kobus, Palaiseau; Albert Kruithof, Meudon, and Lucien Nicolas Leon Viellevoye, Ris-Orangis, all of France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed May 16, 1972, Ser. No. 253,717
Int. Cl. H04q 3/54
U.S. Cl. 179—18 FG **4 Claims**

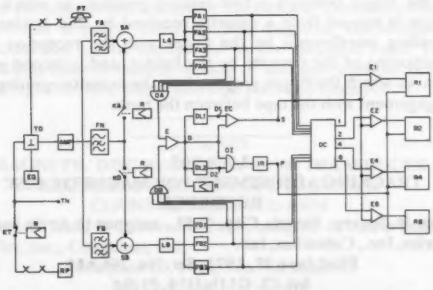


A scanner is disclosed for a telephone switching system which is controlled by a central processor employing a stored program. The different units to be scanned are arranged in groups. The scanner receives from the processor the address of a first group to be interrogated and the number of groups to interrogate. It interrogates the first group and presents the interrogating result to the processor. The processor then gives authorization for stepping to the interrogation of the next group. The scanning progression is carried out by decrementation of the group address. The number of groups is also decremented in the same way until it takes a value of zero, indicating the end of scanning.

3,770,900
AUDIO MULTIFREQUENCY SIGNAL RECEIVER

Emile Morlec, Cagnes sur Mer, France, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 31, 1972, Ser. No. 258,276
Claims priority, application France, June 1, 1971, 7120613
Int. Cl. H04m 1/50; H04q 9/12
U.S. Cl. 179—84 VF **10 Claims**

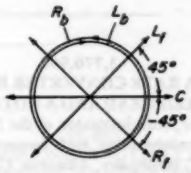


A multifrequency receiver first detects any frequency combination A*i*B*j* corresponding to the frequency combination code which is used, then invalidates that detection or not according to whether the frequency combination received was mixed with other voice frequencies or not. At the rest state, the input signals are applied to both an A-band-pass filter and a B-band-pass filter, which are respectively followed by two limiters then by two sets of selective filters tuned on the particular code frequencies A1 to A4 and B1 to B3. As soon as a possibly valid frequency combination A*i*B*j* is detected, a band stop filter rejecting only frequencies of bands A and B is connected to the receiver input and possible noise sources are disconnected from the receiver input. The output signals from the A-band-pass filter and the band stop filter are added and the resulting signals enter the first limiter. Similarly, the output signals from the B-band-pass filter and the band stop filter are added and the resulting signals enter the second limiter. If the previously detected frequency combination was pure, the selective filter will detect it again and the first detection is validated. If not, the energy of signals Ai and Bj at the limiter outputs will not be high enough to activate the selective filters and the detection is not confirmed.

3,770,901
STEREO-QUADRAPHONIC DISC RECORD

Benjamin B. Bauer, Stamford, Conn., assignor to Columbia Broadcasting System, Inc., New York, N.Y.

Division of Ser. No. 44,244, June 8, 1970, abandoned. This application Sept. 30, 1971, Ser. No. 185,204
Int. Cl. G11b 3/74
U.S. Cl. 179—100.4 ST **4 Claims**



A stereophonic disc record for a four channel sound system has recorded in the groove thereof, as +45° and −45° modulations, signals intended for presentation at the left front and right front corners, respectively, of a listening area, together with modulations adapted to cause a playback stylus to describe a circular motion in one direction representative of audio signals intended for presentation as one of the back corners of a listening area, and modulations adapted to cause a transducing stylus to describe a circular motion in the opposite direction representative of signals intended for presentation at the other back corner of the listening area. The record is reproducible on monophonic or stereophonic playback systems, the former reproducing all of the channels with approximately equal balance, and the latter distributing the four separate channels to the two loudspeakers in a manner to give a balanced and symmetrical reproduction. With an appropriate decoder (also disclosed) the signals transduced from the record may be separated into four signals for presentation on respective loudspeakers positioned at the corners of a listening area to give the illusion of four separate sources of sound.

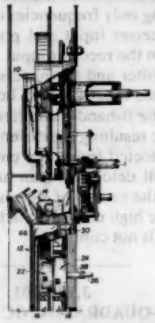
3,770,902
INTERLOCK SYSTEM FOR TAPE TRANSPORT

William F. Witt, Palo Alto, Calif., assignor to Avco Corporation

Continuation-in-part of Ser. No. 50,057, June 26, 1970, abandoned. This application Nov. 12, 1971, Ser. No. 198,260
Int. Cl. G11b 23/08, 15/66
U.S. Cl. 179—100.2 ZA **15 Claims**

A system for interlocking a number of components of a tape transport system when the system is in an operative mode, such as a record, playback, rewind or fast-forward mode. The

system is of the type which utilizes a rotary head assembly, a carriage mechanism for advancing a tape cartridge into an operative location aligned with the head assembly, rotatable spindle structure on which the tape reels of the cartridge are moved as the latter is advanced into its operative locations, and a shiftable arm mechanism having tape guides thereon for



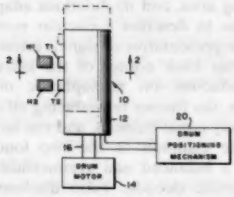
pulling a stretch of the tape out of the cartridge and partially about the rotary head assembly. A number of interlocks on the system assures that certain functions of the components are prohibited as other functions of the components are being performed or as the arm mechanism shifts with respect to the rotary head assembly.

3,770,903

IMAGE DATA RATE CONVERTER HAVING A DRUM WITH A FIXED HEAD AND A ROTATABLE HEAD

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Frederic C. Billingsley, Altadena, Calif.

Filed Feb. 22, 1972, Ser. No. 228,189
Int. Cl. G11b *5/56, 5/76, 21/08*
U.S. Cl. 179—100.2 MD **6 Claims**



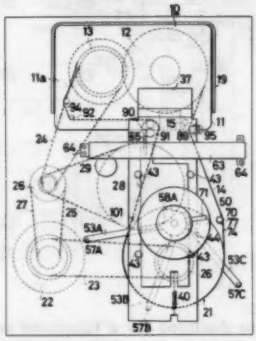
A data-rate converter is disclosed comprising a rotatable data-storing drum with at least one fixed read/record head and a rotatable read/record head. The latter is rotatable in a circular path about the drum axis of rotation. The drum is positionable in any one of a plurality of axial positions with respect to the heads, so that at least one drum track is aligned with the fixed head in one drum position and with the rotatable head in another drum position. When a track is aligned with the fixed head, data may be recorded therein or read out therefrom at a rate which is a function of drum rotation, while when aligned with the rotatable head, data may be recorded or read out at a rate which is a function of the rates and directions of rotation of both the drum and the head.

3,770,904

MECHANISM FOR ENGAGING A MAGNETIC RECORDING TAPE IN A CASSETTE AND FOR WITHDRAWING THE TAPE FROM THE CASSETTE AND PLACING THE TAPE IN ENGAGEMENT WITH THE GUIDE DRUM OF A MAGNETIC RECORDING AND/OR REPRODUCING APPARATUS

Nobutoshi Kihara, 6-3-25 Hatanodai, Tokyo, Japan

Continuation-in-part of Ser. No. 37,623, May 15, 1970, Pat. No. 3,678,217. This application Mar. 27, 1972, Ser. No. 238,284
Claims priority, application Japan, Sept. 22, 1969, 44/75720; Sept. 22, 1969, 44/75721; Sept. 22, 1969, 44/90629The portion of the term of this patent subsequent to July 18, 1989, has been disclaimed.
Int. Cl. G11b *15/66, 23/04*
U.S. Cl. 179—100.2 ZA **5 Claims**



In an apparatus for recording and/or reproducing signals on a magnetic tape wound on reels contained in a cassette having an opening for exposing the tape between the reels, and in which the recording and/or reproducing of signals is effected by a rotary magnetic head moving in a circular path that corresponds with the surface of a tape guide drum mounted on a chassis; a holder is provided on the chassis at a distance from the drum for receiving and positioning the cassette with the opening of the latter facing toward the drum, for example, to engage the reels with a reel driving mechanism, a tape guiding assembly includes at least one finger which is movable from within the opening of a cassette positioned by the holder in a substantially planar path having an arcuate section extending around at least a portion of the circumference of the guide drum for pulling out the tape from the cassette and for wrapping the pulled-out tape about at least such portion of the guide drum circumference, and the tape guiding means and holder are shiftable relative to each other in a direction substantially perpendicular to the plane of the path of movement of the finger between a first relative position, in which the finger is spaced from a cassette received by said holder for avoiding interference by the finger with the reception and positioning of the cassette by the holder, and a second position, in which the finger projects into the cassette opening for engagement with the tape between the reels.

3,770,905

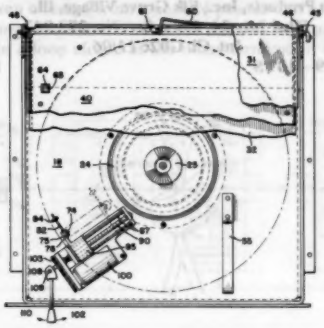
TRACKING ADJUSTMENT FOR MAGNETIC DISC RECORDER

John D. Sperry, Nevada City, Calif., assignor to Arvin Industries, Inc., Columbus, Ind.

Filed June 27, 1972, Ser. No. 266,611
Int. Cl. G11b *5/56, 25/04*
U.S. Cl. 179—100.2 CA **4 Claims**

In a magnetic disc recorder, the transducer is positioned radially of the record disc by having a mounting block movable on a lead screw or equivalent, which is in turn driven by a

positioning motor. The transducer is separately movable, for example by a manual control, for purposes of aligning the transducer with a recorded track, to optimize the playback of



a recorded signal. In the disclosed embodiment the lead screw is movable lengthwise to a limited extent to achieve the alignment adjustment.

3,770,906

FLUTTER RESISTING MAGNETIC RECORDING AND REPRODUCING APPARATUS

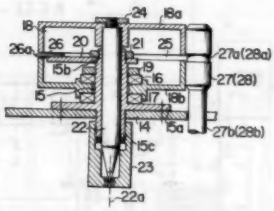
Akira Andoh, Kawasaki, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Feb. 28, 1972, Ser. No. 229,953

Claims priority, application Japan, Mar. 11, 1971, 46/13221

Int. Cl. G11b *5/48, 15/30, 15/28*

U.S. Cl. 179—100.2 C **7 Claims**



Apparatus comprising a rotatable follower drum composed of two hollow cylindrical drum members axially spaced from each other along a common axis to form an axial gap in which at least one magnetic head is disposed such that a tip of the magnetic head projects slightly radially outwardly of the outer circumferential surface of the follower drum. A magnetic tape is brought into pressing engagement with a portion of the outer circumferential surface of the follower drum by a drive roller and a pinch roller so that magnetic recording or reproduction can be carried out by the magnetic head. The apparatus assures smooth motion of the tape past the head, and helps eliminate flutter and tape jitter and vibration.

3,770,907

MAGNETIC DISC RECORDER WITH TRANSDUCER ACCESSING MECHANISM UTILIZING A COUNTERWEIGHTED ARM

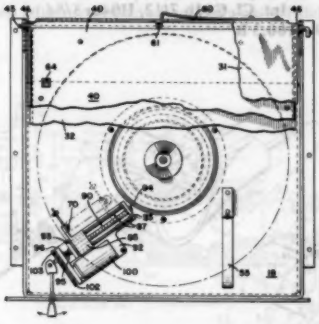
Robert P. Hall, Sr., Auburn, Calif., assignor to Arvin Industries, Inc., Columbus, Ind.

Filed June 27, 1972, Ser. No. 266,612

Int. Cl. G11b *5/56, 25/04*

U.S. Cl. 179—100.2 CA **3 Claims**

A magnetic disc recorder has a rotatable flexible record disc, a transducer interfacing with the disc and carried on a slide movable toward and away from the disc surface. The slide moves on a block which is movable to carry the transducer along a radius of the disc. A counterweighted arm acts



between the block and slide urging the transducer to interface with the disc and providing an inertial mass which damps unwanted motion of the transducer.

3,770,908

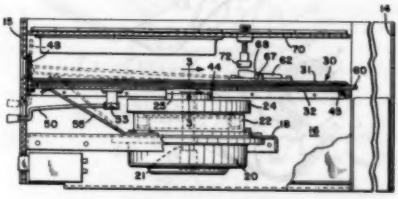
MAGNETIC DISC RECORDER WITH A CARRIAGE FOR RECEIVING AND MOVING A CASSETTE INTO PLAYING POSITION

Lester R. Craggs, Nevada City, Calif., assignor to Arvin Industries, Inc., Columbus, Ind.

Filed June 27, 1972, Ser. No. 266,613

Int. Cl. G11b *5/56, 23/04*

U.S. Cl. 179—100.2 Z **5 Claims**



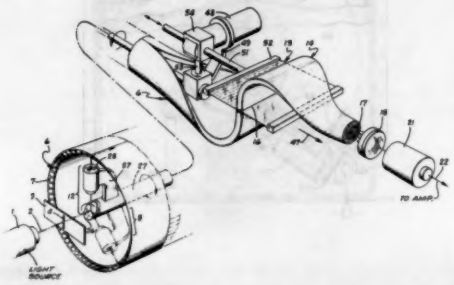
A magnetic disc recorder is provided with an edge loading carriage having provisions to receive and locate a disc cassette relative to a drive hub. The carriage is movable between a loading position where cassette may be inserted or removed, and a playing position where the drive hub engages a complementary hub in the cassette and a transducer interfaces with the record disc in the cassette. The carriage includes a latch retaining the cassette in the operating position, and an ejector functioning to unload the cassette partially in the loading position.

3,770,909

APPARATUS FOR PLAYBACK OF SOUND FROM MICROFICHE

Charles R. Rose, 5710 Harbord Dr., Oakland, Calif., and Geroge E. Artiano, 5622 Maxwelton Rd., Oakland, Calif.

Filed Apr. 21, 1972, Ser. No. 246,354
Int. Cl. G11b 7/12; H04m 5/84
U.S. Cl. 179—100.3 B **1 Claim**



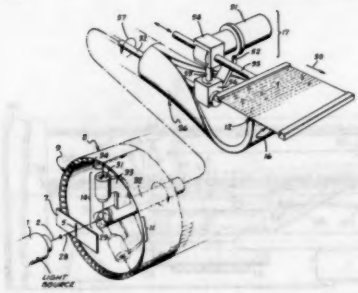
An apparatus consisting briefly of a light source, a circular to linear scanner comprising a plurality of optic fibers, a microfiche recording, a linear to circular condenser comprising a plurality of optic fibers, an optical focusing lens, a photo detector, an amplifier and speakers.

3,770,910

APPARATUS FOR RECORDING SOUND ON MICROFICHE

Charles R. Rose, 5710 Harbord Dr., Oakland, Calif., and George E. Artiano, 5622 Maxwelton Rd., Oakland, Calif.

Filed Apr. 21, 1972, Ser. No. 246,356
Int. Cl. G11b 7/12; H04m 5/84
U.S. Cl. 179—100.3 B **1 Claim**



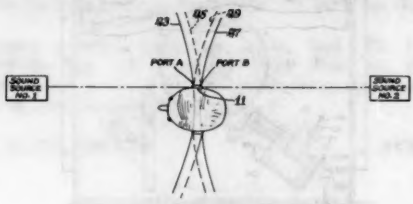
An apparatus consisting briefly of a laser means for generating a beam of coherent electromagnetic radiation a record disc player or magnetic tape player for producing a signal to be recorded, a modulator for receiving the beam and the signal; an extinction control operatively connected to the modulator; a member having a slit therein for passing the modulated beam, a circular to linear scanner consisting of optic fibers; a recording member in microfiche format and apparatus for moving the recording member during the recording process.

3,770,911

HEARING AID SYSTEM

Hugh Shaler Knowles, Elgin, and Elmer Victor Carlson, Prospect Heights, both of Ill., assignors to Industrial Research Products, Inc., Elk Grove Village, Ill.

Filed July 21, 1972, Ser. No. 273,943
Int. Cl. G02c 11/06
U.S. Cl. 179—107 S **18 Claims**



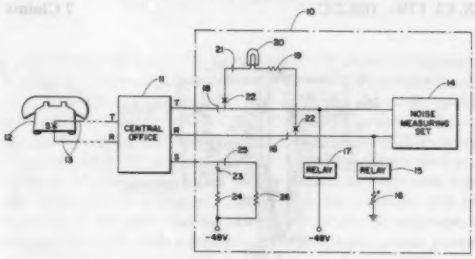
A hearing aid system for providing improved and adjustable directivity.

3,770,912

CIRCUIT FOR AUTOMATICALLY DISCONNECTING A TEST SET FROM A TELEPHONE LINE

William Douglas Alford, St. Lambert, Quebec, Canada, assignor to Bell Canada, Montreal, Quebec, Canada

Filed July 5, 1972, Ser. No. 269,121
Int. Cl. H04m 3/22
U.S. Cl. 179—175.2 C **5 Claims**



The invention provides a circuit for automatically disconnecting a test set from a telephone line when the subscriber requests service. Switch means connected to the telephone line are responsive to the direct current flowing through the telephone line when the subscriber goes off-hook for automatically disconnecting the test set from the subscriber telephone line.

3,770,913

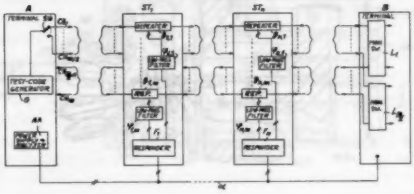
SYSTEM FOR REMOTE SUPERVISION OF TWO-WAY REPEATER STATIONS IN MULTICHANNEL PCM TELECOMMUNICATION PATH

Roberto Camiciottoli, Milan, and Dino Marchini, Trezzano Sul Naviglio, both of Italy, assignors to Societa Italiana Telecomunicazioni Siemens s.p.a., Milano, Italy

Filed Jan. 31, 1972, Ser. No. 222,144
Claims priority, application Italy, Jan. 29, 1971, 19899 A/71
Int. Cl. H04b 3/46
U.S. Cl. 179—175.31 R **10 Claims**

A multichannel PCM telecommunication path, extending between two terminal stations, comprises a d-c service line common to *m* parallel channels which are divided into two groups for transmission in opposite directions. A plurality of cascaded repeating stations, with m repeaters each, are in-

serted in that path and are each provided with a single band-pass filter designed to pass a test frequency individual to any repeating station. The test frequency is established by an unbalanced interrogation code which is iteratively transmitted over a given channel from a control post at one terminal over an outgoing channel and returned thereto over an incoming channel in a loop closed at the other terminal in response to



the code. The filtered-out test frequency can be fed to the control post via the service line from the outputs of the two repeaters in the closed loop by way of two transformers and respective diodes which are inversely biased by a d-c potential on the service line, the polarity of this potential being reversible at the control post to select either of these repeaters for testing.

3,770,914

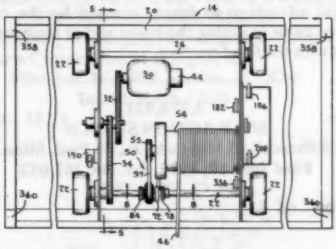
REMOTE CONTROL TARGET APPARATUS

Henry A. Larsen, Manitowish Waters, Wis., assignor to Arrowmatic, Inc., Manitowish Waters, Wis.

Division of Ser. No. 748,140, June 5, 1968, Pat. No. 3,559,994, which is a continuation-in-part of Ser. No. 420,757, Dec. 23, 1964, abandoned. This application Aug. 31, 1970, Ser. No. 68,522

Int. Cl. H02g *11/02*

U.S. Cl. 191—12.2 A **4 Claims**



A target apparatus for an archery range including a wheeled cart mounted on a track. The drive motor is energized and controlled by means of a cable connected between a take-up device mounted on the cart and one end of the range. A control means is provided to selectively drive the cart between opposite ends of the range and to position the cart at preselected distances from the front of the range. Various safety devices are provided to automatically stop the cart at opposite ends of the range and to stop the cart and sound an alarm should a user step onto the range.

3,770,915

JOY STICK DIGITAL DIRECTION AND RATE CONTROL UNIT

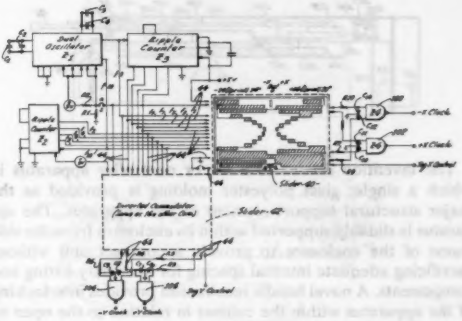
Walter V. Bennett, Granada Hills, and Norman J. Bose, N. Hollywood, both of Calif., assignors to The Singer Company, Rockefeller Plaza, New York, N.Y.

Filed Aug. 14, 1972, Ser. No. 280,681

Int. Cl. H01h *19/58*

U.S. Cl. 200—6 A **9 Claims**

A joy stick type of manual control unit is provided for digitally positioning objects in the X-Y plane, and which is capable of controlling the direction and rate of the object in that plane by a single control and in one continuous movement. The control unit includes a joy stick type of handle which is mounted in a housing for universal pivotal movement. The joy stick handle is spring loaded to return to its central position when released. A pair of circuit boards is mounted in the housing adjacent one another, and a pair of sliders is sand-



wiched between the circuit boards for reciprocal rectilinear movement in a particular plane at right angles to one another. The sliders are mechanically coupled to the joy stick to be moved thereby past sets of brushes extending from the circuit boards, so that corresponding digital signals are generated corresponding to each different pivotal position of the joy stick.

3,770,916

VEHICLE IGNITION SWITCH

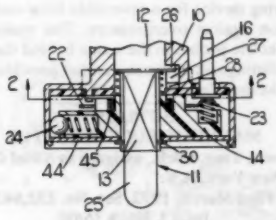
John William Cardwell, 8 Tatton St., Colne, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed May 12, 1972, Ser. No. 252,744

Claims priority, application Great Britain, May 12, 1971, 14,540/71

Int. Cl. H01h *27/00*

U.S. Cl. 200—44 **2 Claims**

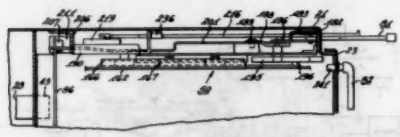


A vehicle ignition switch having a plunger which operates a gearbox locking device. The switch has a housing and the plunger, which is rotatable relative to the housing, extends from the housing and slidable relative thereto into and out of a locking position. The housing carries fixed contacts for selective engagement by movable contacts carried by the plunger upon rotary movement of the latter. A slot in the housing is engaged by a projection carried by the plunger so that, in order to rotate the plunger to a position in which the fixed contacts are not engaged by any of the movable contacts, the plunger must be slid into its locking position.

3,770,917
DRAW OUT SWITCHGEAR ASSEMBLY WITH SUSPENDED LINEAR GUIDE SUPPORT MEANS FOR MOVABLE CONTACTOR

John O. Tjebben, Wauwatosa, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed June 2, 1972, Ser. No. 259,145
Int. Cl. H01h 9/00
U.S. Cl. 200—50 AA 13 Claims

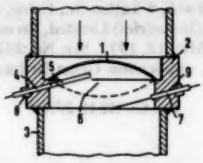


The invention relates to a motor controller apparatus in which a single, glass polyester molding is provided as the major structural support element of the apparatus. The apparatus is slidably supported within its enclosure from the side frame of the enclosure to provide a compact unit without sacrificing adequate internal spacing for necessary wiring and components. A novel handle mechanism provides interlocking of the apparatus within the cabinet in relation to the open or closed condition of the access door.

3,770,918
MONITORING DEVICE FOR REVERSIBLE BLOW-OUT DISC

Manfred Fortmann, Bensberg, Germany, assignor to Interatom, Internationale Atomreaktorbau GmbH, Bensberg/Cologne, Germany

Filed Nov. 5, 1971, Ser. No. 195,925
Claims priority, application Germany, Nov. 14, 1970, P 20 56 167.5
Int. Cl. H01h 35/24; F16k 17/40
U.S. Cl. 200—61.08 5 Claims



A monitoring device for a reversible blow-out disc protects an installation against overpressure. The mointoring device comprises electric probes in the space behind the rupture disc. The probes distinguish between various possible types of malfunction in the installation.

3,770,919
MAGNETIC BUCKLE SWITCH

Donald J. Lewis, Troy, Mich., assignor to Allied Chemical Corporation, New York, N.Y.

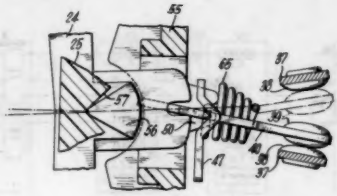
Filed Mar. 6, 1972, Ser. No. 232,042
Int. Cl. H01h 36/00
U.S. Cl. 200—61.58 B 6 Claims

Switch in seat belt buckle which operates upon insertion of tongue of buckle and operates under magnetic force when tongue is not inserted in buckle to give signal indication or interlock with ignition.

3,770,920
ROCKER-TYPE ELECTRICAL SWITCH

John M. Poliak, East Meadow, N.Y., assignor to Leviton Manufacturing Co., Inc., Brooklyn, N.Y.

Filed Feb. 9, 1972, Ser. No. 224,880
Int. Cl. H01h 13/28
U.S. Cl. 200—67 A 14 Claims



The invention relates to a rocker-type electrical wall switch which is used with alternating current and operates with limited angular movememt of a pivoted rocker. The ends of the rocker remain substantially flush with a wall plate in different operating positions of the rocker.

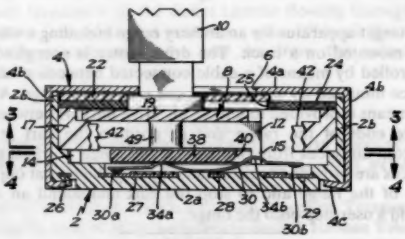
In operation of the switch, the pivoted rocker tilts a coil spring relative to the plane of a pivoted contact-carrying brush and moves the lower end of the brush into or out of engagement with fixed contacts. Cams on the rocker are also urged into engagement wtth the pivoted brush by the coil spring. The cams hold the lower end of the brush in en lagement with one of the fixed contacts under pressure from the spring and increase the load carrying capacity of the switch.

The rocker and the brush are pivoted at spaced points in a cover and a base and the pivot points are aligned wih each other on the transverse center line of the switch. Thus, variations in the lengthwise dimensions of the rocker or other parts due to manufacturing tolerances or the like do not affect assembly or operation of the switch. The cams on the rocker engage with the pivoted brush at a point which provides a mechanical advantage to forces exerted by the coil spring through the cams in urging the lower end of the brush into engagement with the fixed contact.

3,770,921
SNAP-ACTION SWITCH

Lester L. Wilbrecht, 45 Mid Oak Ln., St. Paul, Minn.

Filed June 12, 1972, Ser. No. 262,052
Int. Cl. H01h 13/28
U.S. Cl. 200—68 7 Claims



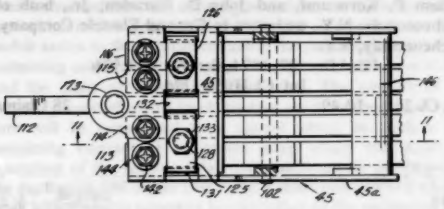
A snap-action slide switch for micro-circuitry incorporates a slidable drive plate for closing the switch contacts in a quick, positive manner by means of a slide actuator which picks-up the drive plate and rapidly moves it to a contact closing position at the exact instant that the slide actuator is snap-released by detent springs positioned in its slide path. The location and configuration of contact engaging shoulders on the drive plate may be selectively changed so as to permit a plurality of circuits to be closed in a desired sequence and combination.

3,770,922

CIRCUIT BREAKER CONTACT STRUCTURE

Carl E. Gryctko, Haddon Heights, N.J., assignor to I-T-E Imperial Corporation, Philadelphia, Pa.

Filed July 27, 1972, Ser. No. 275,568
Int. Cl. H01h 33/12
U.S. Cl. 200—146 R 14 Claims



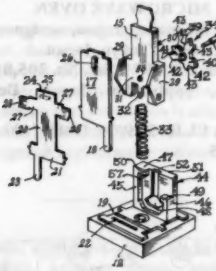
A multi-phase air magnetic circuit breaker of very high continuous current rating is provided with a compact movable contact structure for each phase thereof by having a first plurality of main contacts positioned in a first transverse row adjacent to and in front of a second plurality of main contacts positioned in a second transverse row. These main contacts are symmetrically arranged on each side of the arcing contact arm, and the arms for the first plurality of main contacts are aligned with and extend over the arms for the second plurality of main contacts. In addition, each of the main contacts includes a portion projecting sideways from the respective arms to which the main contacts are mounted, with these projecting portions being positioned either below the arcing contact arm or in the normally vacant section of space provided for elements connecting the movable contact structure to the operating mechanism therefor.

3,770,923

ALTERNATE-ACTION SWITCH ACTUATOR WITH PAWL STOP PLATE ALSO PROVIDING A GUIDE FOR STROKE-CONTROL MEANS

John W. Habecker, Waukegan, Ill., assignor to Cherry Electrical Products Corporation, Waukegan, Ill.

Filed Jan. 14, 1972, Ser. No. 217,838
Int. Cl. H01h 13/56
U.S. Cl. 200—153 J 3 Claims



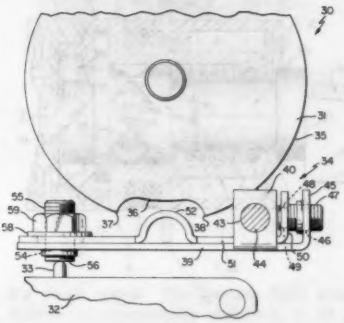
A push-button key switch having an actuator movable within a hollow casing normally closed by a base plate that provides support for a fixed contact-bearing terminal and a second movable contact-bearing terminal as well as an actuator control plate which cooperates with a stroke-control member carried by and movable with the actuator, which movement results in alternate full and half strokes of the actuator, which in turn determine the making, maintaining, and breaking of circuit-making contact between the terminals.

3,770,924

CAM OPERATED ELECTRICAL SWITCH AND WITH TANGENTIALLY AND RADIALLY THREADABLY ADJUSTABLE CAM FOLLOWER THEREFOR

George M. Hipple, Jackson Township, and Paul M. Rowley, Bexley, both of Ohio, assignors to Robertshaw Controls Company, Richmond, Va.

Filed June 30, 1972, Ser. No. 267,914
Int. Cl. H01h 3/42
U.S. Cl. 200—153 LB 18 Claims



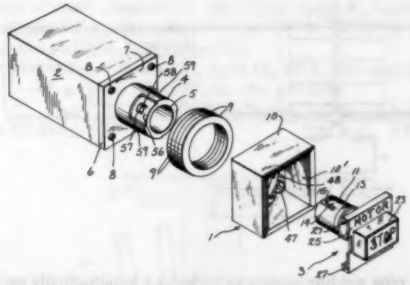
A cam operated electrical switch construction having a rotatable cam, an electrical switch provided with a moving plunger and a cam follower construction for operating the plunger in response to rotation of the cam relative to the cam follower construction. The cam follower construction has a support pivotally mounted relative to the cam and plunger. A cam follower is carried by the support and a pair of rotatable adjusting members are carried by the support for adjusting the cam follower substantially tangentially and radially of the cam to thereby provide for adjusting cam timing and switch tripping.

3,770,925

SWITCH MOUNTING STRUCTURE

Terrance D. Nelson, Milwaukee, and Raymond H. Hannula, West Allis, both of Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed July 10, 1972, Ser. No. 270,420
Int. Cl. H01h 9/08
U.S. Cl. 200—168 C 8 Claims



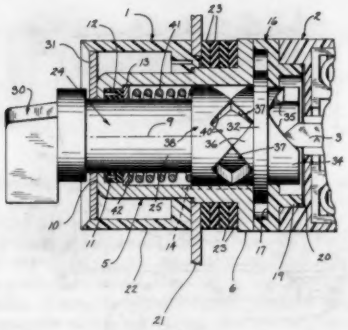
A molded plastic cover encloses and fastens the actuator sleeve of an electrical switch to a control panel. The cover includes a pair of rotatable wedging members which are operated by a screwdriver to engage a bearing surface on the actuator sleeve. When rotated to a locked position, the wedging members separate the bearing surface from the control panel and thereby draw a clamping surface against the back surface of the control panel to fasten the switch thereto.

3,770,926

SELECTOR SWITCH ACTUATOR WITH PART OF DETENT MEANS INTEGRAL WITH ACTUATOR CAM

Vernon W. Wanner, Milwaukee, Wis., assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed July 27, 1972, Ser. No. 275,602
Int. Cl. H01h *3/50*
U.S. Cl. 200—166 SD **10 Claims**



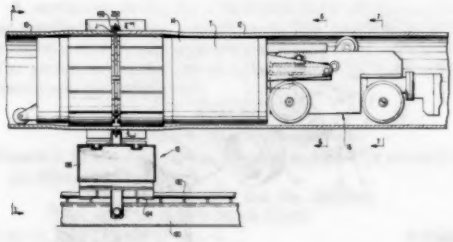
A rotor of a switch actuator includes a selector cam having a serrated cam surface which mates with the serrated cam surface on a selector cam follower. The selector cam follower is slidably retained within an actuator sleeve which surrounds the rotor and the cam follower is forced into mating engagement with the selector cam by a bias spring. The force of the spring is translated by the serrated cam surfaces into a torque which provides a snap-action when the rotor is rotated between its selectable positions.

3,770,927

PIPE WELDING APPARATUS AND METHODS THEREFOR

John Christopher, Redwood City, Calif., assignor to Santa Fe International Corporation, Los Angeles, Calif.

Division of Ser. No. 108,383, Jan. 21, 1971, Pat. No. 3,697,720. This application Dec. 14, 1971, Ser. No. 207,963
Int. Cl. B23k *13/02*
U.S. Cl. 219—8.5 **15 Claims**



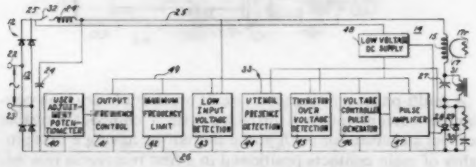
The pipe welding apparatus includes a longitudinally movable welding station, a longitudinally movable nest housing a traveller including a pipe aligner and expander and a traction assembly. A pair of pipe sections are butted one to the other and the welding station is displaced into alignment with the joint. The nest is moved to an end of a pipe section remote from the joint and the traveller moves from the nest through the pipe section to the joint. The pipe aligner and expander has a plurality of circumferentially arranged shoes which move radially outwardly to enlarge the butting end portions of the pipe sections and to draw the pipe sections axially toward one another when welding. The welding station includes an induction welder. Upon completion of the welding, the traveller returns to the nest.

3,770,928

RELIABLE SOLID STATE INDUCTION COOKING APPLIANCE WITH CONTROL LOGIC

William P. Kornrumf, and John D. Harnden, Jr., both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 27, 1971, Ser. No. 211,926
Int. Cl. H05b *5/04*
U.S. Cl. 219—10.49 **28 Claims**



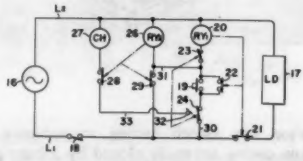
A smooth-top cooking appliance for inductively heating cooking utensils comprises a flat induction heating coil driven at an ultrasonic frequency by a solid state inverter. The control circuit for the inverter is suitable for fabrication as an integrated circuit and includes, in addition to turn-on circuitry, protection circuits to assure reliable and automatic operation under abnormal circuit conditions such as overvoltages and low input voltages tending to cause device and power circuit failures. The control circuit also includes a utensil presence detection circuit to assure operation under load and no-load conditions. Voltage responsive sensors such as Zener diodes sense the appropriate voltages at selected points on the power circuit and modify the operation of the control circuit, preferably by over-riding and inhibiting the turn-on circuitry. Disclosed with regard to a one-thyristor, variable frequency series resonant inverter with an added maximum frequency control, the protection circuit technique is applicable to inverters generally.

3,770,929

ACTUATOR FOR OPERATING AN ALARM DEVICE TO INFORM THE COMPLETION OF COOKING IN A MICROWAVE OVEN

Kyozo Kobayashi, Shizuoka, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

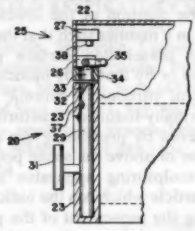
Filed Dec. 8, 1971, Ser. No. 205,811
Claims priority, application Japan, Dec. 28, 1970, 45/135813
Int. Cl. H05b *9/06*; G08b *1/00*
U.S. Cl. 219—10.55 **7 Claims**



An actuator for operating an alarm device to inform the completion of cooking in a microwave oven is provided and includes an oscillation source for generating microwave energy, the oscillation source being connected through a pair of transmission lines to a source of commerical electricity. A door switch is inserted in one of the transmission lines and the

same is opened by the opening of a door which provides access to an oven portion. A first relay is provided which includes a main contact which is inserted within one of the transmission lines and the same will control the operation and stopping of the microwav energy oscillation source. The first relay additionally includes an excitation coil and a self sustaining contact for maintaining operation of the first relay once the same is properly actuated. A timer is provided for setting a predetermined time for cooking and the same includes a contact which is connected between the pair of transmission lines and in series to the excitation coil of the first relay and the self sustaining contact and is further connected to the door switch and the main contact of the first relay. The contact of the timer is provided with a back contact portion which upon closure will be connected to a circuit which includes a self sustaining contact of a second relay which will maintain operation of the second relay once actuated by excitation of the excitation coil of the first relay, a main contact of a second relay which is also actuated by excitation of the excitation coil of the first relay and an alarm device which is enabled by the main contact of the second relay and operated upon closure of the back contact portion such that the alarm device for informing the completion of cooking is continuously actuated from the time of completion of cooking until the opening of the door. The contact of the timer includes a pair of interlocked and simultaneously operated contacts one of which includes the back contact portion for operating the alarm upon closure of the back contact.

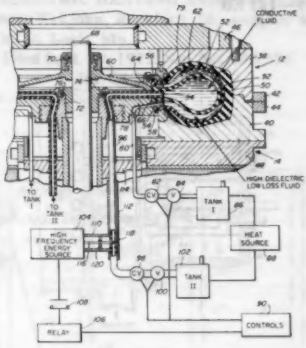
3,770,930
MICROWAVE OVEN APPARATUS
Arthur Y.C. Tang, 4 Amy Road, Framingham, Mass.
Filed Jan. 3, 1972, Ser. No. 215,050
Int. Cl. H05b *9/06*
U.S. Cl. 219—10.55 **10 Claims**



Disclosed is a safety switch apparatus for microwave ovens that insures that the microwave generator is enabled only when the oven door is closed. The switch is responsive only to an irregularly shaped actuator that is operable only when the oven door is closed so that protection is afforded against exposure to microwaves generated while one is tampering with the oven as well as against accidental irradiation resulting from an open door.

3,770,931
DIELECTRIC HEATING APPARATUS FOR TIRES
Charles L. Gilliatt, Andover, Mass., assignor to Raytheon Company, Lexington, Mass.
Filed Aug. 2, 1972, Ser. No. 277,463
Int. Cl. H05b *5/00, 9/00;* **B29h** *5/26*
U.S. Cl. 219—10.57 **10 Claims**

A method of and apparatus for heating moldable articles, such as pneumatic rubber tires, is disclosed utilizing an inner expandable bladder having an electrically conductive fluid, such as mercury, salt water, or woods metal. A source of high frequency energy in the range of, illustratively, from 1 to 60 megahertz is coupled between the conductive fluid and the metallic tire vulcanizing apparatus to rapidly heat the inner casing wall surfaces to the desired curing temperatures. A second outer bladder conforming to the casing walls contains a high dielectric constant low thermal loss fluid, such as silicone oil. The inner bladder is contoured to provide a greater volume of such fluid adjacent to the thinner sidewalls and thereby expose the heated conductive fluid closer to the

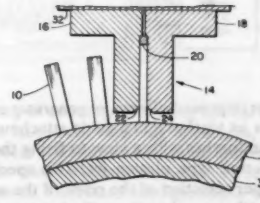


thicker tire tread region. The heating field strengths are thereby distributed substantially uniformly in all parts of a moldable article having a nonsymmetrical cross-sectional configuration and it is maintained in the desired shape during heating.

3,770,932
SHORT-CIRCUIT INERT GAS CONSUMABLE ELECTRODE PROCESS USING ADDITIONS OF 10-14% NITROGEN
George H. Cotter, Springville, and William C. Hanes, North Tonawanda, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.
Filed June 28, 1971, Ser. No. 157,709
Int. Cl. B23h *9/16*
U.S. Cl. 219—74 **2 Claims**

A gas shielded consumable electrode welding process for welding of materials such as 9 percent nickel steels and nitrogen stainless steels with relatively inexpensive stainless steel wire which includes utilizing a shielding gas of 10–14 percent nitrogen balance argon, helium or mixtures thereof, and a short-circuit arc deposition as the arcing process.

3,770,933
APPARATUS FOR WELDING BLADES TO ROTORS
Kenneth H. Holko, Strongsville, and Thomas J. Moore, Berla, both of Ohio, assignors to The United States of America as represented by the administrator of the National Aeronautics and Space Administration
Division of Ser. No. 134,658, April 16, 1971. This application Apr. 24, 1972, Ser. No. 247,055
Int. Cl. B23k *11/04*
U.S. Cl. 219—107 **5 Claims**



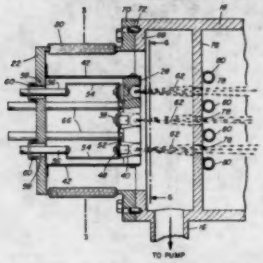
Using magnetic force upset welding to form T-joints between dissimilar thickness parts. This type of resistance welding is used to join compressor and turbine parts thereby reducing the weight and cost of a jet engine.

3,770,934

ELECTRON BEAM HEATING APPARATUS

Jacob A. Randmer, Wilton, Conn., assignor to The Machlett Laboratories, Incorporated, Springdale, Conn.

Filed Oct. 29, 1971, Ser. No. 193,932
Int. Cl. B23k *15/00*
U.S. Cl. 219—121 EB **4 Claims**



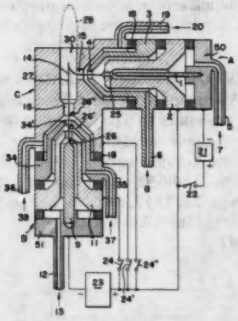
Electron beam heating apparatus for heating a large area workpiece in a vacuumized area by electron bombardment, including means for forming and beaming a plurality of ribbon-shaped electron beams which combine into a single beam of uniform current density and large cross-section for heating the workpiece.

3,770,935

PLASMA JET GENERATOR

Haruo Tateno, Tokyo, and Torao Ichimiya, Hayama-Machi, both of Japan, assignors to Rikagaku Kenkyusho, Wako-shi Saitama-ken, Japan

Filed Dec. 21, 1971, Ser. No. 210,350
Claims priority, application Japan, Dec. 25, 1970, 45/118284; Sept. 17, 1971, 46/72338
Int. Cl. B23k *9/00*
U.S. Cl. 219—121 P **3 Claims**



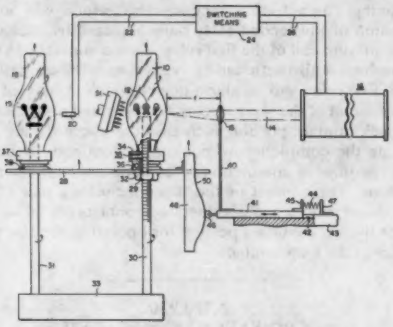
Disclosed is an improved plasma jet generator comprising at least two plasma jet torches and a guide attachment integrally connected to the torches with a view to fixing the anode foot of a non-transferred type plasma jet. This special structure permits the proper selection of the point of the anode foot of the plasma jet with respect to the cathode spot of the plasma jet, thus realizing a high voltage plasma jet. Also, the new structure prevents the local erosion to the parts of the electrodes on which the anode foot and the cathode spot stand by means of an inactive gas, thus allowing the main arc column to directly heat a high concentrated active gas.

3,770,936

APPARATUS FOR SCULPTURING AN INDICIA OR DECORATIVE DESIGN IN THE SURFACE OF AN ARTICLE WITH A BEAM OF CORPUSCULAR ENERGY

Clair M. Rively, Old Bridge, and James Petro, Little Falls, both of N.J., assignors to Westinghouse Corporation, Pittsburgh, Pa.

Division of Ser. No. 779,995, Nov. 29, 1968, Pat. No. 3,701,880. This application May 11, 1971, Ser. No. 142,394
Int. Cl. B23k *15/00*
U.S. Cl. 219—121 LA **6 Claims**



An indicia or artistic pattern, etc. is sculptured into the surface of an article, such as a glass envelope for an electric lamp or the like, by subjecting the article to a laser or an electron beam and varying the position of the article relative to the beam at a speed and in a manner such that the beam scans the article and removes preselected surface portions thereof either by vaporization or by thermally induced fracturing and spalling. In the case of vitreous or ceramic articles that are susceptible to thermally-induced fracturing, etching by vaporization is achieved by preheating the article to a temperature which is near or above the strain point of the material. The preferred sculpturing apparatus includes a laser source, a prototype article which has the indicia on its surface, means for correlating the movement of the prototype article and the article being processed relative to the laser beam and a scanning photocell, and means for maintaining the laser beam in focused relationship with the surface of the article when the latter is of non-planar configuration.

Novel decorative effects in the case of glass lamp bulbs are achieved by laser-etching the desired pattern in a coating on the exterior surface of the bulb and by subjecting a bulb to a series of laser pulses which produce a plurality of spaced cavities in the bulb surface by thermally-induced spalling and give it a pleasing facet-like appearance.

3,770,937

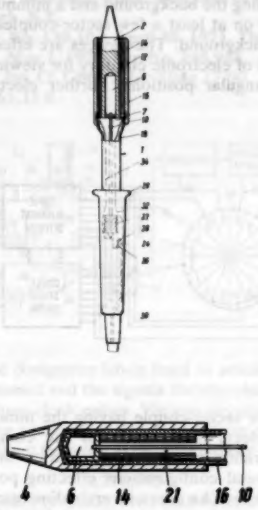
TEMPERATURE CONTROLLED ELECTRIC HAND SOLDERING IRON

Marius Smits, Furstenallee 24, 3548 Arolsen/Waldeck, Germany

Filed Dec. 21, 1971, Ser. No. 210,505
Claims priority, application Germany, Dec. 22, 1970, P 20 63 276.2
Int. Cl. H05b *1/02*; B23k *3/04*
U.S. Cl. 219—241 **1 Claim**

A temperature controlled electric hand soldering iron has a handle which carries a support tube in which the soldering tip and a heating element are mounted. The soldering tip has a bore formed therein in which the support tube is received, a liquid expansion control thermostat being located in the bore at the innermost end thereof. The thermostat is partially en-

closed within the tube and extends forwardly thereof for contact with the soldering tip at the end of the bore. A switch is



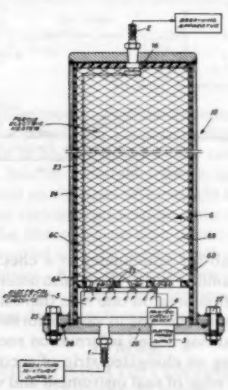
located in the handle for controlling the heating element and is responsive thermally to a capilliary tube that projects from the thermostat.

3,770,938

TANK HEATER FOR RESPIRATORY MIXTURES USED IN DEEP DIVING

Christian A. Agarate, Marseille, Comex, France, assignor to Compagnie Francaise Des Petroles, Paris, Compagnie Maritime D'Expertises, Marseille, both of France

Filed Sept. 1, 1971, Ser. No. 176,894
Claims priority, application France, Feb. 12, 1971, 7104747
Int. Cl. H05b *1/00;* **F24h** *3/04;* **A62b** *7/02*
U.S. Cl. 219—374 **8 Claims**



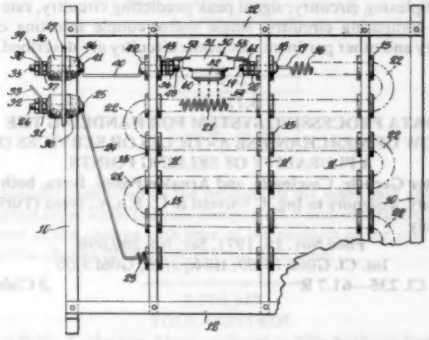
A tank heater for respiratory mixtures used in deep underwater diving which includes a heating coil of a plurality of counter wound wires enclosed within a sealed gas tank for heating and closely regulating the temperature of the breathing gas fed to an underwater diver. A temperature sensor is located within the tank adjacent the outlet port of the tank and is connected to appropriate electrical control circuits and a suitable power supply to control the heating coil. The tank and wires are insulated. The tank can also serve as a reserve tank of gas for the diver.

3,770,939

ELECTRIC HEATING ASSEMBLIES

Leonard Dennis Kokjohn, Rockford, Ill., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Sept. 19, 1972, Ser. No. 290,395
Int. Cl. H05b *3/06*
U.S. Cl. 219—532 **6 Claims**



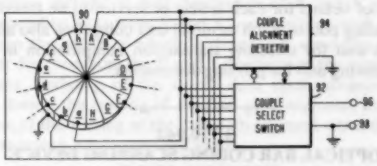
An electric heating assembly comprising a frame formed of a plurality of laterally spaced strips which support an open coil electric heating element. The heating element is formed in sinuous fashion to provide a plurality of reaches held in position to extend crosswise of the strips. Opposite ends of the heating element are electrically connected to terminals carried by the frame, and a thermostatic switch is connected in series between a terminal and the respective end of the heating element. The switch has a thermal sensor which faces and is disposed in close proximity to a reach of the heating element so as to be quickly affected by changes in heat generated by the element.

3,770,940

OPTICAL BAR CODING SCANNING APPARATUS

Jerome Danforth Harr, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 12, 1971, Ser. No. 198,331
Int. Cl. G06k *7/14, 9/13;* **G01n** *21/30;* **G06k** *19/06*
U.S. Cl. 235—61.11 E **43 Claims**



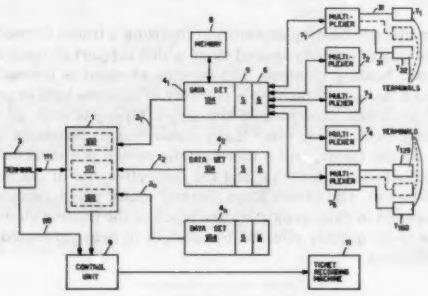
The scanning of documents bearing optical bar coding, particularly with hand-held scanning apparatus, is enhanced by an optical system effecting an elongated aperture substantially parallel to the bars without constriction as to the orientation of the apparatus. Corelated configurations of light sources, light sensitive devices, aperture plates and/or prisms are arranged with one or more effectively rotating under control of electronic circuitry for viewing the bars at a multiple of angular positions is disclosed. Preferably a photosensitive diode arrangement of substantially circular configuration is divided into a multiple of radially extending sectors isolated from each

other, and diametrically collinear sectors are connected together as sector-couples. Light from the document striking the array of sector-couples produces a maximum on all sector-couples scanning the background and a minimum on one sector-couple or on at least a few sector-couples scanning bars against the background. Electronic circuitry determines the sector-couple having the minimum response and selects that couple for the completion of the scanning operation or until disorientation dictates another selection. Another embodiment comprises a circular photosensitive section insulated from the sectors and located centrally of the sector couples. In this embodiment the photosensitive section is connected to the chosen sector couple for improved resolution. Electronic multiplexing circuitry, signal peak predicting circuitry, rate of rise comparing circuitry, single sector-couple selecting circuitry and other pertinent electronic circuitry are described.

3,770,941
DATA PROCESSING SYSTEM FOR HANDLING THE FLOW OF MERCHANDISE ARTICLES OR SERVICES ON A PLURALITY OF SELLING POINTS

Walter Gechele, Cascinette, and Arnaldo Pasini, Ivrea, both of Italy, assignors to Ing. C Olivetti & C., S.p.A., Ivrea (Turin), Italy

Filed Nov. 18, 1971, Ser. No. 200,090
Int. Cl. G06k *15/00*; **H04q** *3/00*; **G06f** *3/00*
U.S. Cl. 235—61.7 R **3 Claims**



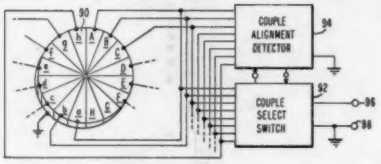
A data processing system for handling the flow of merchandise articles or services on a plurality of selling points comprises in each selling point a terminal unit for reading data identifying the article or service sold on a ticket associated therewith and for transmitting said data to a central computer. An additional terminal unit is adapted to transmit the number of articles or services available to the computer which in turn causes a recording unit to record accordingly a predetermined number of tickets for each article or service to be transferred to the sellng points. Each terminal unit comprises also an add-subtract unit for effecting transaction computation in local and a printing unit for printing documents.

3,770,942
OPTICAL BAR CODING SCANNING DEVICE

David Harwood McMurtry, Portola Valley, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 14, 1972, Ser. No. 225,895
Int. Cl. G06k *7/14*, *19/06*; **G01n** *21/30*; **G06k** *9/13*
U.S. Cl. 235—61.11 E **19 Claims**

The scanning of documents bearing optical bar coding, particularly with hand-held scanning apparatus, is enhanced by an optical system effecting a pointed elongated aperture substantially parallel to the bars without constriction as to the orientation of the apparatus. A photosensitive diode arrangement of substantially circular configuration is divided into a multiple of radially extending pointed sectors isolated from each other, and diametrically collinear sectors are connected together as sector-couples. Light from the document striking the array of sector-couples produces a maximum on all sector-couples scanning the background and a minimum on one sector-couple or on at least a few sector-couples scanning bars against the background. The devices are effectively rotating under control of electronic circuitry for viewing the bars at a multiple of angular positions. Further electronic circuitry

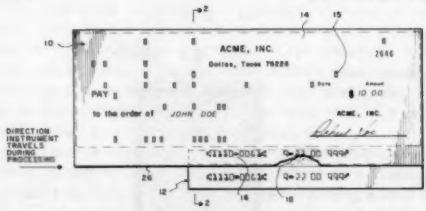


determines the sector-couple having the minimum response and which selects that couple for the completion of the scanning operation or until disorientation dictates another selection. Several configurations effecting pointed aperture stops are disclosed. An alternate embodiment comprises a circular photosensitive section insulated from the sectors and located centrally of the sector couples. In this embodiment the photosensitive section is connected to the chosen sector-couple for improved resolution.

3,770,943
CHECK PROCESSING TAB

Floyd E. Sill, Richardson, Tex., assignor to Banctec Incorporated, Dallas, Tex.

Filed Apr. 6, 1972, Ser. No. 241,629
Int. Cl. B42d *15/00*; **G06k** *19/00*
U.S. Cl. 235—61.12 R **6 Claims**

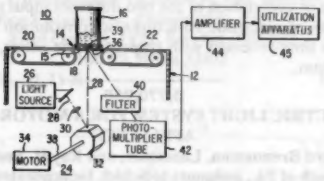


An improved tab for attachment to a check, draft, credit card receipt, or similar single sheet instrument wherein said instrument has a first area on one side thereof for selectively carrying information recorded in various forms, a second area on said one side having coded information recorded thereon, said tab comprising an elongated strip of record material extending along one edge of said instrument and with one side of said record material for recording electromagnetic and/or optically readable information thereon, and an elongated strip of binding material attached to and between the other sides of said instrument and said record material to removably attach said record material to said instrument, said binding material being attached to said instrument at a location which does not extend into said first area, and wherein the combined thickness of said record material and said binding material approximates the thickness of said instrument.

3,770,944
ARTICLE IDENTIFICATION APPARATUS

Joseph Francis Schanne, Cheltenham, Pa., and Franklyn George Nickl, Northboro, Mass., assignors to RCA Corporation, New York, N.Y.

Division of Ser. No. 139,103, April 30, 1971. This application May 1, 1972, Ser. No. 248,945
Int. Cl. G06k 7/10; E04g 17/00
U.S. Cl. 235—61.11 E **5 Claims**

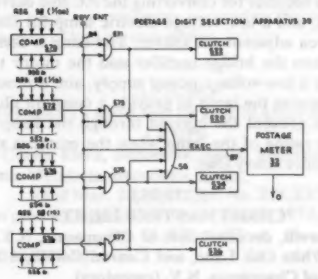


Binary coded designator labels fixed to articles which they identify are scanned and the signals thereby obtained are employed to produce clock pulses. Various circuits are included for checking the accuracy of signals read from a label and for distinguishing them from marks or other data on the article.

3,770,945
PARCEL POSTAGE METERING SYSTEM

Daniel F. Dlugos, Huntington; Gerald C. Freeman, Norwalk, and Peter N. Piotroski, Stamford, all of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Division of Ser. No. 107,223, Jan. 18, 1971, Pat. No. 3,692,988. This application Apr. 10, 1972, Ser. No. 242,851
Int. Cl. G06m 3/06
U.S. Cl. 235—92 EA **4 Claims**



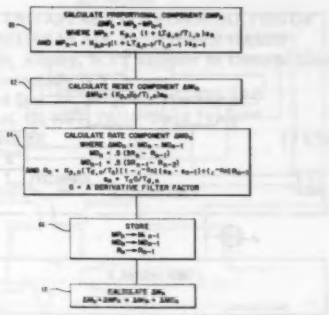
A parcel postage metering system includes electromechanical apparatus for positioning the various digit selector arms of a postage meter in accordance with the corresponding digits of the postage, held in an output register, applicable to a parcel as determined on the basis of its weight and destination. A motor drives the various digit selector arms through individual clutches, and the instantaneous digit positions of the arms are separately compared with the corresponding postage digits in the output register. As comparisons are achieved, the associated clutches are disengaged leaving the arms in appropriate postage digit selection positions.

3,770,946
METHOD FOR AUTOMATIC CONTROL WITH TIME VARYING TUNING

Harry A. Fertik, Philadelphia, and Charles W. Ross, Hatboro, both of Pa., assignors to Leeds & Northrup Company, Philadelphia, Pa.

Filed Feb. 25, 1971, Ser. No. 118,793
Int. Cl. G05b 11/42; G06f 15/18
U.S. Cl. 235—150.1 **13 Claims**

A velocity algorithm which provides for proportional, reset and rate control functions without any resulting loss of information under conditions involving the variation of the tuning constants. The proportional component is separately computed as the change with time of the product of the proportional gain and the control error. The rest component is

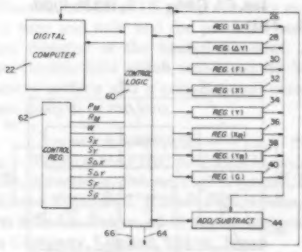


separately computed as the product of the reset gain and the control error while the rate component is also separately computed as the change with time of the product of the rate gain and the change of the control error with time.

3,770,947
TOOL CONTROL

Don Deily, Lexington, Mass., assignor to City National Bank of Detroit, Detroit, Mich. and Robert C. Fisher

Filed Aug. 20, 1971, Ser. No. 173,408
Int. Cl. G06f 15/46
U.S. Cl. 235—151.11 **8 Claims**



System for control of tool drive with respect to at least X and Y axes to trace a first path segment and to approach a second path segment (e.g., for tool offset, or to trace an inscribed curve tangent to the two path segments), by steps comprising storage of data descriptive of X and Y positions corresponding to current X and Y tool positions and of a first function the value of which is dependent upon the perpendicular distance from the X and Y positions to the second path segment, updating of the stored data upon advance of the drive during the tracing of the first path segment, and interruption of the tracing of the first path segment when the function assumes a predetermined value.

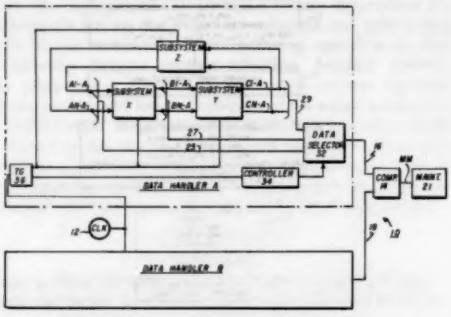
3,770,948
DATA HANDLING SYSTEM MAINTENANCE ARRANGEMENT

James P. Caputo, Chicago, Ill.; Robert J. Chybowski, Oak Creek, Wis., and Phil R. Harrington, Mt. Prospect, Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed May 26, 1972, Ser. No. 257,125
Int. Cl. G06f 15/16
U.S. Cl. 235—153 AE **7 Claims**

A switching system having a duplicated pair of data handlers which generate duplicated pairs of handling or

processing signals for reliability purposes, includes a comparator for determining a mismatch between the signals of any one or more of the pairs of signals to indicate a maintenance problem in the system, a pair of data selectors for supplying



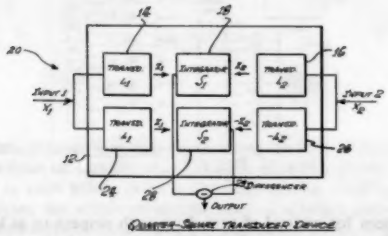
one at a time sets of the pairs of signals to be compared to the comparator, and a selection controller for enabling selectively the pair of data selectors, whereby greater flexibility of operation and cost reduction are achieved.

3,770,949

ACOUSTIC SURFACE WAVE CORRELATORS AND CONVOLVERS

Harper John Whitehouse, and Jeffrey M. Speiser, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 21, 1972, Ser. No. 246,346
Int. Cl. G06g 7/19; H03h 9/00
U.S. Cl. 235—181 **10 Claims**



QUADRATURE-SQUARE TRANSDUCER DEVICE

An acoustic surface wave device comprising a substrate capable of propagating an acoustic wave across its surface and two pairs of electrode structures disposed upon the surface of the substrate, each pair aligned parallel to the direction of wave propagation, one pair aligned parallel to the other. Each of the four electrode structures are adapted for connection to an input electrical signal, which, upon transduction upon the surface of the substrate, causes an acoustic wave to propagate along the surface of the substrate, both acoustic waves being parallel, the acoustic waves generated by the same pair of electrode structures propagating in the same line, either in the same direction or in opposed directions.

Each electrode structure comprises a pair of sets of parallel, interdigitated, electrodes, oriented in a direction perpendicular to the direction of surface wave propagation, and a pair of bus bars, at opposite ends of, perpendicular to, and connecting, the interdigitated electrodes, the other bus bar connecting the remaining electrodes. The four electrode structures are so coded that the sum of the auto correlation functions of the coding is equal to a delta function.

The acoustic surface wave device further comprises a pair of spatial integrators, disposed upon the substrate, one for each parallel pair of electrode structures. One integrator has as its two inputs the surface wave outputs from two of the parallel electrode structures, while the other integrator has as its two inputs the surface wave outputs from the other two parallel electrode structures. Each integrator spatially integrates the signal appearing under it produced by the interaction of the acoustic output of the two electrode structures which provide its two inputs.

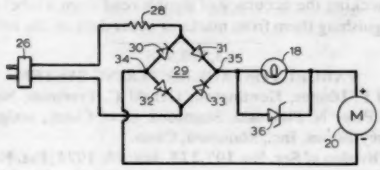
A signal summer has as its two inputs the outputs of the pair of integrators, and its output signal corresponds to the convolution or correlation of the two different input signals to the two pairs of electrode structures, a convolution if one input signal is time-reversed with respect to the other, otherwise a correlation.

3,770,950

ELECTRIC LIGHT SYSTEM FOR A MOTOR-DRIVEN APPLIANCE

J. Edward Brenneman, Lancaster, and Ray H. Enders, Columbia, both of Pa., assignors to Schick Incorporated, Lancaster, Pa.

Filed July 31, 1972, Ser. No. 276,517
Int. Cl. F21v 33/00
U.S. Cl. 240—2 BB **9 Claims**



A compact light-weight electric shaver includes a DC motor, a bridge rectifier for converting the AC line current to DC line current, and a low-voltage electric lamp for illuminating the work area adjacent the shaver. The lamp is connected in series between the bridge rectifier and the motor to obviate the need for a low-voltage power supply, and a zener diode is connected across the lamp to provide a constant illumination level and to prevent the current through the lamp from exceeding the rating of the lamp when the motor is starting or operating under heavy load.

3,770,951

CHRISTMAS TREE LIGHTS

John M. Corelli, deceased, late of Chappaqua, N.Y.; Ronald Corelli, White Oak Lane, and Conrad Corelli, 6 Winthrop Rd., both of Chappaqua, N.Y. (executors)

Filed June 13, 1969, Ser. No. 833,200
Int. Cl. F21p 1/02; F21s
U.S. Cl. 240—10 T **1 Claim**

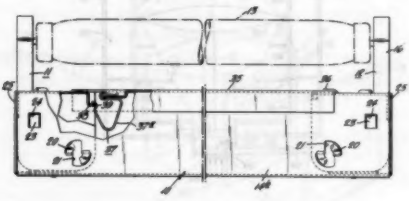
A unitary Christmas tree lighting assembly which provides pluralities of discrete dependent strings of series connected

lamp elements. The strings are selectively connected at one end, in spaced relation, to a common pair of primary conductors within a deformable mounting element formed of insulating material; each of the strings has a remotely locatable free end to facilitate progressively remote disposition of the lamp elements thereof relative to the mounting element.

3,770,952
LIGHTING FIXTURE HAVING FOLD-OUT LAMP SOCKETS

Charles A. Trowbridge, Wrightstown, Pa., assignor to Sim-Kar Lighting Fixtures Co., Philadelphia, Pa.

Filed Oct. 25, 1972, Ser. No. 300,452
Int. Cl. H05b *33/02*
U.S. Cl. 240—51.11 R **10 Claims**

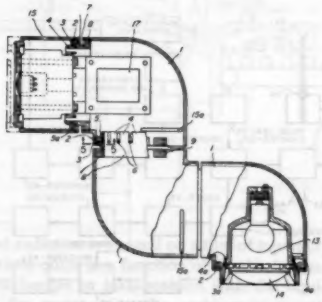


A fluorescent lamp fixture is provided with fold-out lamp socket assemblies. The socket assemblies are mounted in the ends of a channel member to pivot outwardly from their nested shipping positions and into their extended positions for mounting a lamp therebetween. Each socket assembly is secured in its extended position by means of a latch, and an end plate is provided for insertion into each end of the channel member to close the same. A closure plate extends along and encloses the length of the channel member, and the ends of the closure plate are releasably secured to the socket assemblies by means of locking assemblies.

3,770,953
IMPROVEMENTS APPLIED IN THE MANUFACTURE OF LAMPS

Antonio Cortes Riera, Barcelona, Spain, assignor to Sociedad Anonima Metalarte, Barcelona, Spain

Filed Mar. 28, 1972, Ser. No. 238,837
Claims priority, application Spain, Jan. 4, 1972, 398,574
Int. Cl. F21s *1/02*
U.S. Cl. 240—73 BJ **7 Claims**

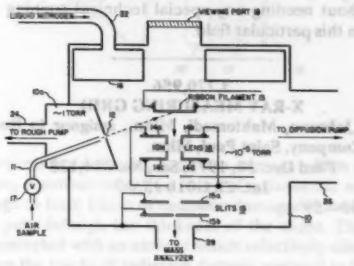


The base and three elbowed sections of the lamp are rotatably and detachably secured together by a ring fixed inside the open end of one section and seated in an annular groove in the outer peripheral wall of a resisient crown fixed inside the adjacent open end of the next section. A luminous device with focusing lens is secured in like manner in the outer end of the last elbowed section and air vents are provided in the various sections for the circulation of air through the sections and over the transformer mounted in the base.

3,770,954
METHOD AND APPARATUS FOR ANALYSIS OF IMPURITIES IN AIR AND OTHER GASES

William D. Davis, Albany, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 29, 1971, Ser. No. 213,525
Int. Cl. H01j *39/34*; **B01d** *59/44*
U.S. Cl. 250—41.9 SE **17 Claims**

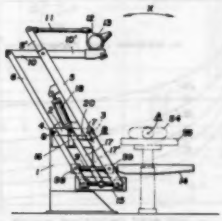


Mass spectrometric analysis of trace impurities including particulate matter in air or other gas utilizes a heated metallic filament on which a sample of the gas is impinged to generate short bursts of ions of the impurity (in the case of particulates) by surface ionization. The gas sample is introduced to the heated filament by passage through a thin tube and impingement on a very small hole prior to entering the chamber in which the filament is located. A pump removes most of the gas between the tube and hole and the particles passing through the hole are directed at the heated filament. An ion lens generates an electric field which withdraws the ions from the heated filament surface and a conventional mass analyzer is used for mass analysis of the ions.

3,770,955
TOMOGRAPHIC APPARATUS

Chuji Tomita, Adachi-ku, Tokyo; Yuji Miyazaki, Matsudo-shi, Chiba; Kazuo Kobayashi, Kashiwa-shi, Chiba, and Mitsuo Okudaira, Kita-ku, Tokyo, all of Japan, assignors to Hitachi Roentgen Company, Limited, Tokyo, Japan

Filed Sept. 14, 1971, Ser. No. 180,260
Int. Cl. H01j *37/20*
Claims priority, application Japan, Sept. 17, 1970, 45/80940
U.S. Cl. 250—52 **7 Claims**



A tomographic apparatus comprising: a principal linkage supporting an X-ray source and a film so that they face each other and having pivot fulcrums between these two members for being swingable in the directions of both axes X and Y; two servo motors for causing the linkage to move in the directions X and Y; means for setting the travel paths of the said two members comprising a plurality of sets of cams provided rotatably on a single rotatable shaft; means for driving only a selected set of cams corresponding to the required paths of the

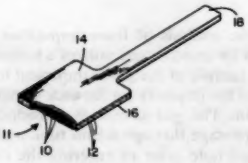
said two members, and cam follower members associated with the said sets of cams, respectively; and adjusting means for comparing the positions of both the X-ray source and the film to be assumed successively in the paths set by the said setting means in the directions of X and Y with the positions of the principal linkage to be assumed successively on the said paths, and for actuating the servo motors until these two groups of positions are brought into agreement with each other. With this arrangement, it is possible to displace, on the established required paths during the X-ray irradiation, both the X-ray source and the film by a mere selection of the required set of cams and to thereby obtain a sharply focused tomogram of any desired region of the object while satisfactorily blurring unnecessary regions of the object not required on the tomogram, without needing any special technical training or experience in this particular field.

3,770,956

X-RAY MEASURING GRID

E. Curtis Johnson, Mahtomedi, Minn., assignor to Buckbee-Mears Company, Saint Paul, Minn.

Filed Dec. 30, 1971, Ser. No. 214,128
Int. Cl. G01b *15/00*
U.S. Cl. 250—59 **1 Claim**



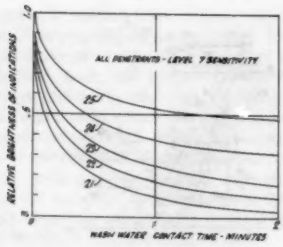
A precision metal grid encapsulated in plastic for blocking X-rays in a coordinate pattern during exposure of X-ray film.

3,770,957

METHOD AND MEANS OF SELECTIVE REMOVAL OF BACKGROUND INDICATIONS IN STABILIZED WATER-WASHABLE INSPECTION PENETRANT PROCESSES

James R. Alburger, 5007 Hillard Ave., La Canada, Calif.

Filed Mar. 24, 1972, Ser. No. 237,765
Int. Cl. G01n *21/16*
U.S. Cl. 250—71 T **3 Claims**



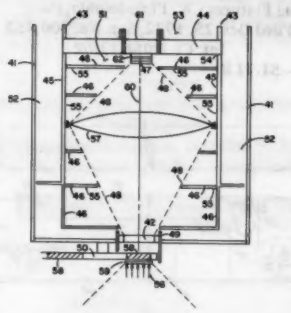
An improvement in the water-washable inspection penetrant process wherein a "stabilized" background-producing water-washable inspection penetrant is employed and the water-wash step is modified to include a brief spray-wash with water, application of an accelerator rinse of a low energy detergent solution, and a final water rinse, whereby background indications of shallow surface discontinuities are selectively removed to a controlled degree.

3,770,958

INFRARED RADIATION DETECTION BY A MATCHED SYSTEM

Burton Krakow, Hopkins, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 5, 1972, Ser. No. 217,704
Int. Cl. G01t *1/16*
U.S. Cl. 250–339 **21 Claims**



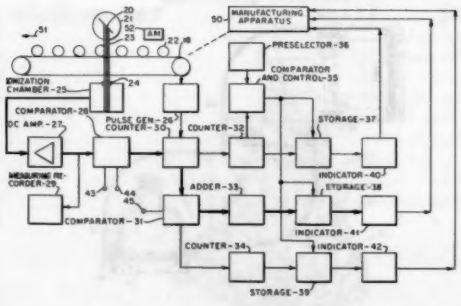
An infrared radiation detection system has a filter capable of transmitting infrared radiation in a passband of wavelengths common to a range of wavelengths in which a cooled detection system sensor is capable of sensing radiation. The filter is matched to the sensor by having a low emissivity in those continuous ranges of wavelengths (1) across which any detector element in the sensor is sensitive to impinging infrared radiation and (2) which overlap in any part any filter passband. The filter positioned in the field of view of the sensor so matched does not appear as a noise source to the sensor despite the filter not being cooled.

3,770,959

METHODS AND MEANS FOR MONITORING ECCENTRICITIES OF COAXIAL MEMBERS

Karl Gloor, Zollikon, and Eugen Halter, Zuerich, both of Switzerland, assignors to Schweissindustrie Oerlikon Buhrle AG, Zuerich, Switzerland

Filed June 3, 1971, Ser. No. 149,759
Claims priority, application Switzerland, June 4, 1970, 8400/70
Int. Cl. G01n *23/02*
U.S. Cl. 250—375 **33 Claims**



As welding electrodes are mass-produced, the mean eccentricity of a number of the electrodes' wires with respect to their surrounding sheaths is monitored, by sequentially passing parallel ones of the electrodes radially past an X-ray source. For each electrode a comparison is made of the X-ray radiation absorbed by the sheath on one side of the wire with

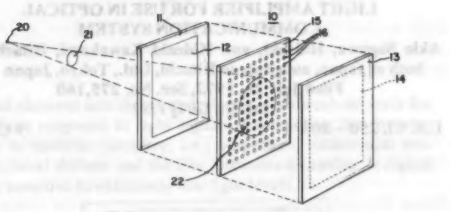
that on the other side of the wire. The absorption measurements indicate when the sheath begins to pass the source, when the rod begins to pass the source, when the rod stops passing the source, and when the sheath stops passing the source. The absolute values of the comparisons are totaled to obtain an indication of the average eccentricity.

3,770,960

X-RAY DISPLAY PANEL

Harold F. Webster, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 97,916, Dec. 14, 1970, abandoned. This application June 26, 1972, Ser. No. 265,982
Int. Cl. G01t *1/16*; H01j *39/00*
U.S. Cl. 250—83.3 R 17 Claims



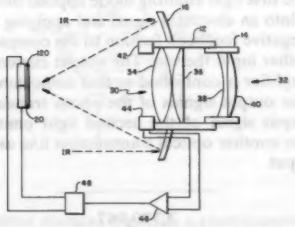
An improved x-ray display panel is disclosed wherein the x-rays forming the pttern to be displayed induce "ionizing events" over the surface of the panel. The photon producing discharges as a result of these events make up a visible image of the x-ray pattern.

3,770,961

LIQUID CRYSTAL IMAGING SYSTEM

William E. Westell, Boston, Mass., assignor to Baird-Atomic, Inc., Bedford, Mass.

Continuation of Ser. No. 109,180, Jan. 25, 1971, abandoned. This application Nov. 24, 1972, Ser. No. 309,287
Int. Cl. G02f *1/16*
U.S. Cl. 250—331 8 Claims



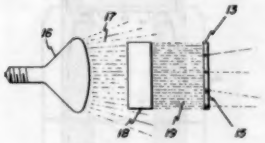
Infrared radiation is imaged on a film of liquid crystal whose characteristic color is a function of its absolute temperature. A heat exchanger in juxtaposition with the liquid crystal is provided for maintaining the ambient temperature of the liquid crystal at the temperature of maximum sensitivity to infrared radiation. A remote sensor responsive to the characteristic color of the liquid crystal controls the heating and cooling cycles of the heat exchanger. In consequence, the liquid crystal is maintained at the temperature of maximum sensitivity by remote sensing of color balance over the entire useful area of the film.

3,770,962

RADIATION DETECTION METHOD

Robert L. Fleischer, Schenectady, N.Y., and Robert M. Walker, St. Louis, Mo., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 1, 1971, Ser. No. 194,362
Int. Cl. G01t *3/00*
U.S. Cl. 250—473 6 Claims



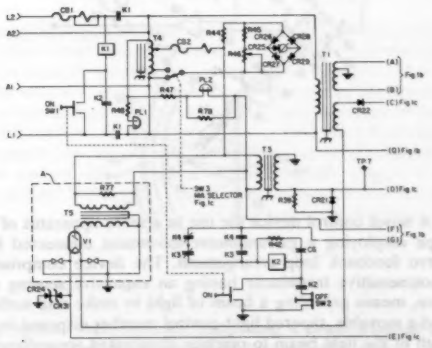
A process for detecting radiation damage which comprises exposing a surface of a thin sheet of a dielectric material to radiation to form tracks of radiation damaged material therein which pass through the thickness of the sheet. The sheet is then contacted with an etchant which selectively dissolves and removes the tracks of radiation damage material to form holes extending from one surface of the sheet through the opposite surface. The resulting holes are a measure of radiation damage and are detected by visual means by detecting the light which emerges from the holes on the one side of the etched sheet while the opposite side of the etched sheet is irradiated with light having a wavelength which is absorbed by the material in an amout sufficient to produce a significant contrast to the light passing through the holes.

3,770,963

DENTAL X-RAY MONITORING SYSTEM

Cornelius Keith Vandervelden, Kansas City, Mo., and Robert Leino, Olathe, Kans., assignors to Litton Medical Products, Inc., Des Plaines, Iowa

Continuation of Ser. No. 889,505, Dec. 31, 1969, abandoned. This application Nov. 1, 1971, Ser. No. 194,600
Int. Cl. H05g *1/26*
U.S. Cl. 250—409 1 Claim



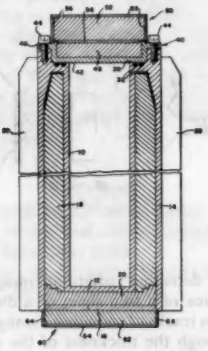
A control circuit for a dental x-ray head having a monitoring system incorporated therein for apprising the x-ray machine operator of various malfunctions that may occur within the x-ray machine.

3,770,964

SHIPPING CONTAINER FOR RADIOACTIVE MATERIAL

Harold A. Backus, Wynwood, Pa., assignor to N L Industries, Inc., New York, N.Y.

Filed May 24, 1971, Ser. No. 146,398
Int. Cl. G21f 5/00
U.S. Cl. 250—506 1 Claim



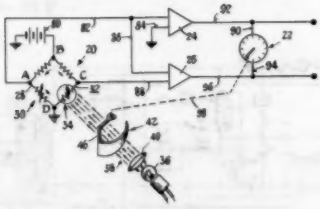
A body means has a cavity therewithin for receiving radioactive material and comprises side wall means including radiation shielding material as well as opposite ends which also include radiation shielding material. A combined energy absorbing and radiation shielding means is supported at opposite ends of the body means and extends outwardly thereof. The combined energy absorbing and radiation shielding means comprises a body of lead covered by a relatively thin layer of readily deformable material.

3,770,965

PHOTOSENSITIVE CONTROL APPARATUS WITH MOVABLE LIGHT CONTROL MEMBER

Harrison F. Edwards, Norwich, N.Y., and Stewart F. Bottorf, Waterbury, Conn., assignors to The Lewis Engineering Company, Naugatuck, Conn.

Filed May 1, 1972, Ser. No. 249,411
Int. Cl. G01j 1/20
U.S. Cl. 250—201 14 Claims



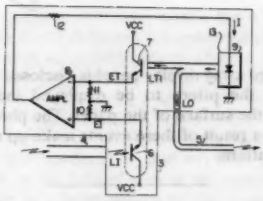
A novel control device for use in a servo apparatus of the type employing a galvanometer movement connected in a servo feedback loop arrangement. The device comprises a photosensitive transducer having an expansive sensing surface, means providing a beam of light to strike said surface, and a movable, tapered light-control member disposed in the path of the light beam to produce illuminated areas disposed on either side of an elongate shadowed area on the sensing surface. The relative size of the illuminated and shadowed areas changes in response to movement of the member, thus varying the transducer response. The control device is employed in a servo apparatus comprising a bridge circuit, one leg of which includes the photosensitive transducer and the other leg of which contains a condition-responsive transducer. Amplifying means are provided, having input terminals connected with the bridge to receive signals therefrom and having output terminals connected to a galvanometer to drive the latter. The light control member is directly carried by the galvanometer movement. Any change in the output of the condition-responsive transducer is sensed by the amplifiers, which drive the glavanometer upscale (or downscale), thus changing the position of the light control member in such a way as to direct more (or less) light on the photosensitive transducer and thereby re-establish balance of the bridge. In this way, changes of the condition-responsive transducer are reflected by a corresponding change in the position of the galvanometer, which can be calibrated in convenient units intended to form the basis for the particular measurement desired.

3,770,966

LIGHT AMPLIFIER FOR USE IN OPTICAL COMMUNICATION SYSTEM

Akio Sagawa, Hideaki, and Hideaki Kawakami, Hitachi-shi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed July 26, 1972, Ser. No. 275,160
Int. Cl. G01j 1/32
U.S. Cl. 250—205 9 Claims



A light amplifier comprising a first photo transistor for converting an optical input applied by way of an optical transmission line into an electrical signal, a comparator amplifier connected to the first photo transistor for receiving the output signal of the photo transistor as one of the two inputs thereto, a first and a second light emitting diode emitting light depending on the output current of the comparator amplifier, and a second photo transistor for converting the optical output signal of the first light emitting diode applied through a pair of polarizers into an electrical signal and applying this electrical signal in negative feedback fashion to the comparator amplifier as the other input thereto. The output current of the comparator amplifier is controlled so that coincidence is attained between the output signals of the photo transistors, and the optical output signal of the second light emitting diode is delivered to another optical transmission line as an amplified optical output.

3,770,967

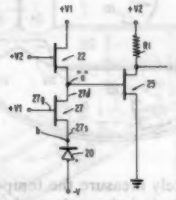
FIELD EFFECT TRANSISTOR DETECTOR AMPLIFIER CELL AND CIRCUIT PROVIDING A DIGITAL OUTPUT AND/OR INDEPENDENT OF BACKGROUND

Robert W. Hanna, Sterling, and John J. Hession, Manassas, both of Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 24, 1972, Ser. No. 229,137
Int. Cl. H01j 39/12
U.S. Cl. 250—214 R 11 Claims

A light sensitive element, typically a photo-transistor, diode or the like, is suitably coupled to a load element, typically an FET device suitably biased as a linear load. An output circuit including a high input impedance element, typically an FET inverter, is coupled between the linear load and the diode. Little or no current flows in the input circuit in the absence of light applied to the light sensitive element. When light is ap-

plied current flows through the light sensitive element and modulates current flow through the inverter. The output circuit has high sensitivity to low level light signals by reason of the linear load and the absence of "Johnson" or thermal noise. A suitable connection between the light sensitive element and



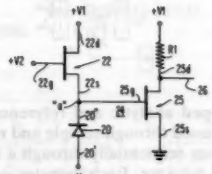
the load element sets the output circuit in a threshold state for immediate response to light signals. Connecting the inverter output to suitable circuitry, i.e., amplifiers, differential amplifiers, level shifters and the like, provides an analog or digital output sensitive to extremely low light levels.

3,770,968

FIELD EFFECT TRANSISTOR DETECTOR AMPLIFIER CELL AND CIRCUIT FOR LOW LEVEL LIGHT SIGNALS

John J. Hession, Manassas, Va., and Harry Klepp, Hopewell Junction, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 24, 1972, Ser. No. 229,138
Int. Cl. H01j *39/12*
U.S. Cl. 250—214 R **4 Claims**



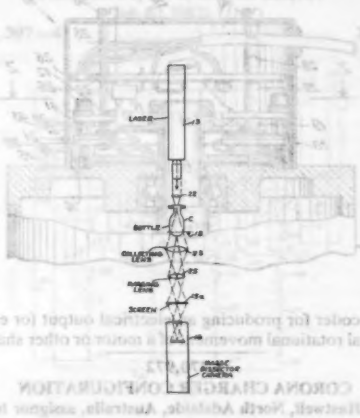
A light sensitive element, typically a phototransistor, diode or the like, is suitably coupled to a load element, typically an FET device suitably biased as a linear load. An output circuit including a high input impedance element, typically an FET inverter, is coupled between the linear load and the diode. Little or no current flows in the input circuit in the absence of light applied to the light sensitive element. When light is applied current flows through the light sensitive element and modulates current flow through the inverter. The output circuit has high sensitivity to low level light signals by reason of the linear load and the absence of "Johnson" or thermal noise. A suitable connection between the light sensitive element and the load element sets the output circuit in a threshold state for immediate response to light signals. Connecting the inverter output to suitable circuitry, i.e., amplifiers, differential amplifiers, level shifters and the like, provides an analog or digital output sensitive to extremely low light levels.

3,770,969

INSPECTING THE BOTTOM WALL OF HOLLOW OPEN-ENDED CONTAINERS

Ronald W. Ansevin, Pittsburgh, Edward D. Avetta, Pittsburgh, and William P. McKay, Irwin, all of Pa., assignors to Owens-Illinois Inc., Toledo, Ohio.

Filed Mar. 9, 1972, Ser. No. 233,084
Int. Cl. H01j *39/12*
U.S. Cl. 250—223 B **35 Claims**



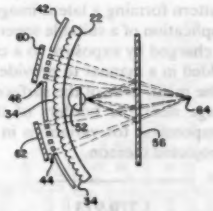
A method and apparatus for inspecting the bottom wall of hollow open-ended containers wherein a beam of radiant energy to which the container is transparent is directed through the open end of the container to illuminate the bottom wall. The beam is further directed against a screen to produce a darkened image of the defect on the screen. The image of the screen is then analyzed by an image scanning device to produce a reject signal when a defect is present.

3,770,970

SHAFT ANGLE ENCODER

Dennis H. Trump, Chelmsford, Mass., assignor to Trump-Ross Industrial Controls, Inc., Billerica, Mass.

Filed Mar. 15, 1972, Ser. No. 234,901
Int. Cl. G01d *5/34*; G01n *21/30*
U.S. Cl. 250—231 SE **15 Claims**



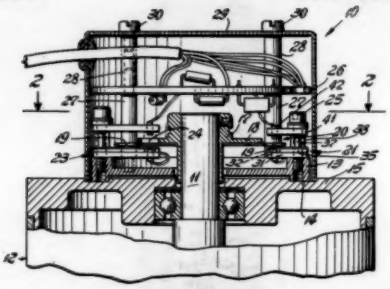
An optical shaft encoder comprising a drum adapted to rotate with the shaft and having light transmissive slots. Light from a source positioned within the drum passes radially through the slots, and is projected upon a slotted stator element positioned outside the drum. A plurality of photoelectric cells, operating as pairs in push-pull, are positioned exterior to the stator element for receiving light beams passing through slots in the stator element and for providing an electrical signal representative of shaft parameters.

3,770,971

ROTATING SHAFT ENCODER

James P. Somerset, Wethersfield, Conn., assignor to The Superior Electric Company, Bristol, Conn.

Filed May 24, 1972, Ser. No. 256,477
Int. Cl. G01d 5/34, 5/36
U.S. Cl. 250—231 SE 9 Claims



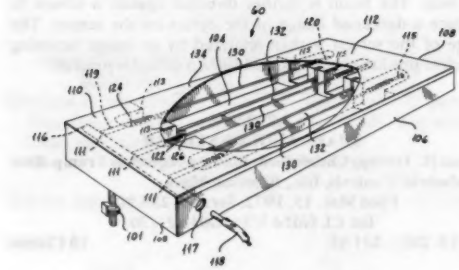
An encoder for producing an electrical output for each incremental rotational movement of a motor or other shaft.

3,770,972

CORONA CHARGER CONFIGURATION

Peter J. Hastwell, North Adelaide, Australia, assignor to Savin Business Machines Corporation, Vahalla, N.Y.

Filed Sept. 11, 1972, Ser. No. 287,694
Int. Cl. G03g 15/00
U.S. Cl. 250—324 11 Claims



Charging Apparatus for an electrostatic copier wherein a photoconductive surface is electrostatically charged and exposed to a light pattern forming a latent image thereon which is developed by application of a suitable toner. The photoconductive surface is charged by exposure to a corona discharge field which is shielded in a manner to provide uniform charge distribution over the major area of the surface, and shaped so as to modify charge near the borders of the surface in a manner which compensates for variations in the intensity of the light pattern projected thereon.

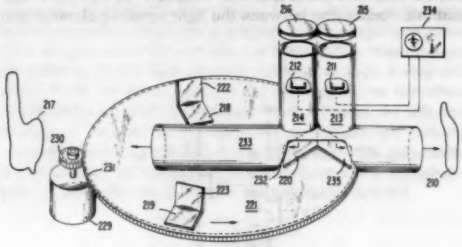
3,770,973

APPARATUS FOR REMOTELY MEASURING THE TEMPERATURE AND EMISSIVITY OF A RADIANT OBJECT INDEPENDENT OF THE OBJECT'S RADIANT SURFACE PROPERTY

William Edward Martin, Hightstown, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 3, 1972, Ser. No. 303,415
Int. Cl. G01t 1/16
U.S. Cl. 250—340 6 Claims

An apparatus comprising first and second thermal sensors operating at first and second temperatures and generating electrical signals in response to thermal radiation from a radiant body and from an external source irradiating the radiant



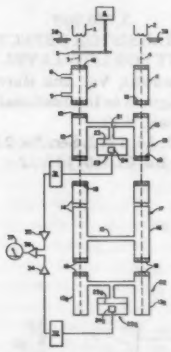
body is used to remotely measure the temperature and emissivity of the radiant body independent of its radiant surface property.

3,770,974

NON-DISPERSIVE INFRARED FLUID ANALYZER WITH COMPENSATION FOR ABSORPTIVE AND MECHANICAL EFFECTS OF AMBIENT CONDITIONS

Glenn Howard Fertig, Etna, Pa., assignor to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed June 29, 1972, Ser. No. 267,358
Int. Cl. G01n 21/34
U.S. Cl. 250—344 8 Claims

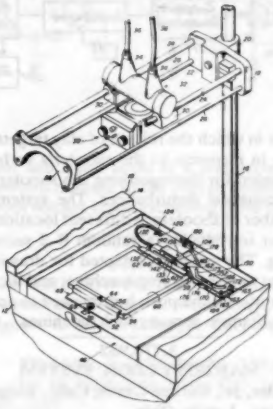


Alternately chopped analytic and reference beams of infrared energy are passed through sample and reference fluids, respectively, and then sequentially through a first detector, a filter, and a second detector. Each detector is of the variable capacitor type responsive to pressure pulses, producing an output signal that is a function of the difference in the energies absorbed in the two beam paths. The first detector responds to absorption by the sample fluid due both to the component of interest and to an ambient condition (icluding the presence in the sample of an interferent having an absorption band overlapping that of the component in a spectral region where both are weakly absorbent). The second detector responds to absorption by the sample fluid due to the ambient condition alone. The filter limits the absorptive response of the second detector to an amount that will compensate for the similar response of the first detector to said ambient condition. The net output signal of the two detectors is a function of the difference of the individual outputs and responsive to component concentration. The two detectors are physically identical, and the signal output of the second detector may be adjusted to eliminate mechanical effects, such as vibration, due to other ambient conditions, without affecting the absorptive sensitivity of the instrument. A modification of more limited application, using a single beam, is also disclosed.

3,770,975
CASSETTE DIRECTION DETECTOR

Leonard F. Peyser, Briarcliff Manor, N.Y., and Karl Leschanz, Alexandria, Va., assignors to The Machlett Laboratories, Incorporated, Springdale, Conn.

Filed June 8, 1972, Ser. No. 260,955
Int. Cl. H05g 1/00
U.S. Cl. 250—491 10 Claims

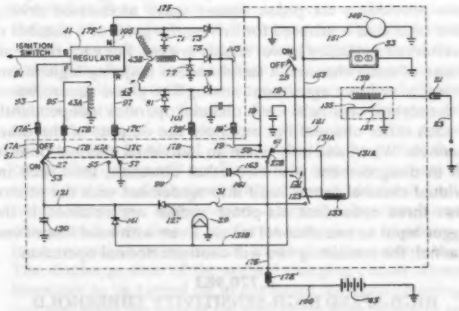


X-ray apparatus including a modified Bucky tray having sensing means for determining the orientation of a film-bearing cassette held between two adjustable clamps and for producing a corresponding electrical signal, said means comprising a feeler probe which causes actuation of an electrical switch when the probe is contacted by an edge of a cassette disposed in one of two possible orthogonal positions.

3,770,976
SYSTEM FOR INCREASING THE OUTPUT OF A MULTI-PHASE RECTIFIED ROTARY FIELD SYSTEM

Lebern W. Stroud, and Jack E. Everett, both of Fort Worth, Tex., assignors to R. G. Ralls, Saginaw, Tex., a part interest

Filed Aug. 24, 1972, Ser. No. 283,496
Int. Cl. H02p 11/00
U.S. Cl. 307—10R 9 Claims

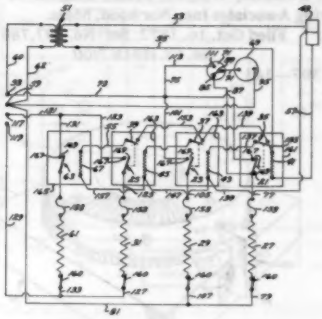


The specification discloses a system adapted to be coupled to the alternator-rectifier system of a motor vehicle and including feedback means for employing the output of the alternator-rectifier system for self-exciting the rotary field thereof when current is drawn from the output by a welding unit or other type of load. A DC power supply is employed normally to excite the rotary field during no-load conditions. The output of the DC power supply to the rotary field is terminated when the load draws current from the output of the alternator-rectifier system.

3,770,977
SEQUENTIAL LOADING SYSTEM HAVING AUXILIARY SWITCHES

Harold A. McIntosh, South Pasadena, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Jan. 31, 1972, Ser. No. 222,107
Int. Cl. H02j 3/14
U.S. Cl. 307—41 2 Claims

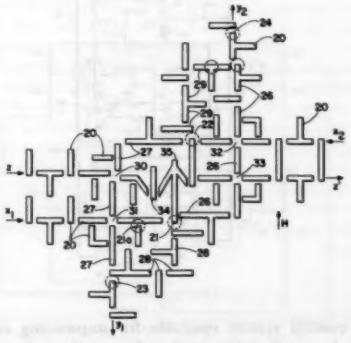


A sequential loading control system including a plurality of main switches controlling current flow to respective loads. Respective time delay drive means are provided for controlling the respective main switches and respective auxiliary switches are mechanically coupled with the main switches to form respective units and are closed when the main switches are closed. Circuit means connects the main switches to the respective loads and the auxiliary switches of each unit with the time delay drive of the succeeding unit whereby energization of the system results in the respective time delay drive means being sequentially energized to effect closure of the respective main switches and also the auxiliary switches to energize the time delay means of the succeeding unit to thereby sequentially bring the loads into the circuit.

3,770,978
MAGNETIC BUBBLE DOMAIN SWITCHING DEVICE

Werner Erich Kluge, Kanata, Ontario, Canada, assignor to Bell Canada-Northern Electric Research Limited, Ottawa, Ontario, Canada

Filed June 12, 1972, Ser. No. 261,589
Int. Cl. G11c 11/14
U.S. Cl. 307—88 LC 4 Claims



A switching device for magnetic bubble domains which can be used to carry out three functions:— AND, duplication and inversion. The device is defined by a magnetizable overlay

pattern in which magnetic bubble domains in two main channels can be caused to propagate either along the main channels from input to output or along interconnecting channels from the input on one main channel to the output on the other main channel. Deflection is by interaction positions on a control channel. The number of propagation steps from any input position to any output position is equal. Domain idling positions occur at intersections of any channels.

3,770,979

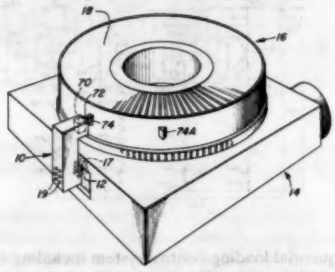
PROJECTOR SLIDE ADVANCE TIMER

Allen K. Swanson, Walpole, Mass., assignor to Hamton Engineering Associates Inc., Norwood, Mass.

Filed Oct. 16, 1972, Ser. No. 297,780

Int. Cl. H01h *7/00*

U.S. Cl. 307—141 **22 Claims**



An adapter for insertion into the remote function receptacle of a conventional slide projector to receive operating power therefrom and for enabling continuous and automatic slide advancement having a variable timing adjustment for controlling the time interval between slides. The slide projector is preferably of the carousel-type, and the adapter may include a microswitch responsive to the position of the carousel for interrupting the automatic slide advancement at one or more positions of the carousel.

3,770,980

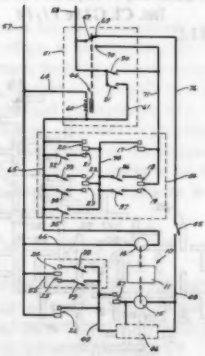
PROGRAMMED CYCLE SELECTION CIRCUIT

William J. McNally, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa

Filed Oct. 6, 1972, Ser. No. 295,545

Int. Cl. H01h *43/00*

U.S. Cl. 307—141 **15 Claims**



A control system operable for sequencing an apparatus through a selectable cycle of operations includes circuit means for selecting a pair of selectable cycles of operations and for advancing the apparatus through first and second selected cycles in a predetermined order regardless of the order of selection of the two cycles.

3,770,981

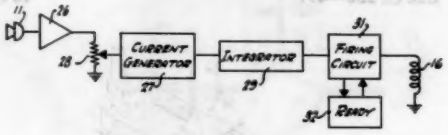
VOICE CONTROLLED TARGET RELEASE SYSTEM

Thomas Sloan Nelsen, 616 Foothill Rd., Stanford, Calif.

Filed Apr. 29, 1971, Ser. No. 138,433

Int. Cl. F14c *19/12*

U.S. Cl. 307—154 **17 Claims**



Trap system in which the release of clay targets is controlled electronically in response to the shooter's verbal command. Means is included for distinguishing the shooter's commands from other acoustical disturbances. The system will accommodate a number of shooters at different locations, and means is included for introducing a random 0–3 second delay for skeet shooting. The system is adapted for drawing its operating power from an existing trap machine, and it can be used as a direct substitute for the push-button used to actuate the target release mechanism in many such machines.

3,770,982

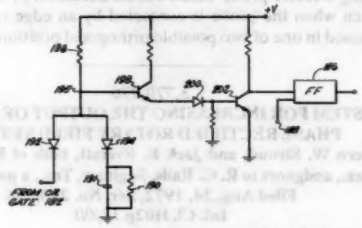
MAJORITY LOGIC SYSTEM

Luther C. Butler, Jr., Garden Grove, Calif., assignor to Lorain Products Corp., Lorain, Ohio

Division of Ser. No. 8,875, Feb. 5, 1970. This application Apr. 16, 1972, Ser. No. 244,948

Int. Cl. H03k *19/12, 19/24, 21/36*

U.S. Cl. 307—215 **7 Claims**



Each of three redundant multiphase signal generating circuits provides a six phase square wave modulated driving pulse train that is adapted for driving the gates of a number of inverters of a standby power supply system. For each of the six phases of each channel, a simultaneous majority logic is employed to enforce agreement among like phase square waves of the several channels. Each channel operates independently of each other channel but monitors the outputs of the other channels. When and only when an individual channel finds itself in disagreement with two other channels, then such individual channel forces itself into agreement with the others. Thus three redundant six-phase signals are retained if the trigger input to one channel is lost. Even with total loss of one channel, the remaining two will continue normal operation.

3,770,983

HIGH-SPEED HIGH-SENSITIVITY THRESHOLD DETECTOR

James S. Gray, Indiatlantic, Fla., assignor to Harris-Intertype Corporation, Cleveland, Ohio

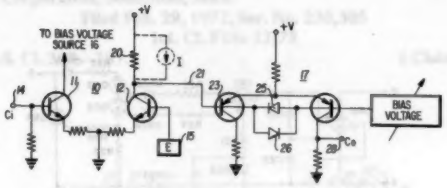
Filed Oct. 12, 1971, Ser. No. 188,365

Int. Cl. H03k *5/20, 5/08, 5/153*

U.S. Cl. 307—235 R **7 Claims**

A two stage threshold detector in which the first stage is used for buffering and stabilization and the second stage constitutes a current mode switch. The first stage - second stage interface is a network having a configuration and component

value selected to optimize the speed of response of the current mode switch to input voltage transitions through the threshold level. The input circuit of the current mode switch is clamped



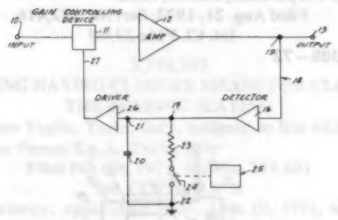
at the upper and lower limits of a preselected linear voltage range to prevent damage to the overall detector circuit in the event of input voltage levels exceeding these limits.

3,770,984

FAST RECOVERY LOW DISTORTION LIMITER CIRCUIT

Dale C. Connor, and Robert P. McDonough, both of Quincy, Ill., assignors to Harris-Intertype Corporation, Cleveland, Ohio

Filed Mar. 3, 1971, Ser. No. 120,470
Int. Cl. H03k *5/08*; **H03g** *3/32*, *11/04*
U.S. Cl. 307—237 **6 Claims**



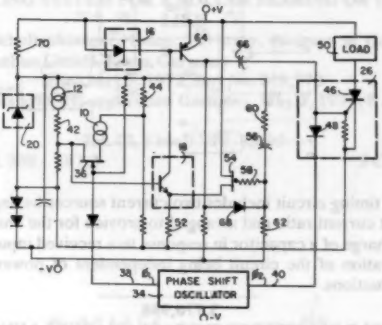
A signal limiter for reducing and increasing the gain of a circuit with the required speed of response without introducing distortion in the limiter output. The limiter includes a variable gain circuit having an output coupled to a detector in a feedback loop. The detector develops a DC signal which is then coupled back to the gain control device to reduce or increase the gain in accordance with the output signal level. A charging circuit is coupled to a point between the detector and the gain controlling device to hold a high level signal appearing at the output of the detector for a given time interval. Switching means are then provided to discharge the charging circuit after the lapse of a predetermined time interval to allow the gain to return to normal. This assures that the gain of the gain controlling device will not fluctuate in response to every signal waveform peak. Such rapid fluctuations would result in distortion at the output of the limiter. The switching circuit consists of several forms. One of the forms comprises a transistor having a second charging circuit coupled to the emitter thereof. The discharge time of the second charging circuit allows the transistor to be turned on to discharge the main charging circuit and allow the gain of the gain controlling device to return to normal. In a second form, the second charging circuit is coupled to the base of the transistor, and the operation is similar to that described above. In a further embodiment, a switching means of any general configuration may be provided in shunt with the main charging circuit and operated according to a given timing sequence. In another embodiment, a zener diode may be used to discharge the principal charging circuit when the voltage applied to the anode thereof through a second charging circuit decreases to a given level.

3,770,985

VOLTAGE COMPARATOR STRUCTURE AND METHOD

Robert S. Meijer, Chicago, Ill., assignor to Alnor Instrument Company, Div. Illinois Testing Laboratories, Inc., Chicago, Ill.

Filed Dec. 17, 1971, Ser. No. 209,191
Int. Cl. H03k *5/20*
U.S. Cl. 307—235 R **19 Claims**



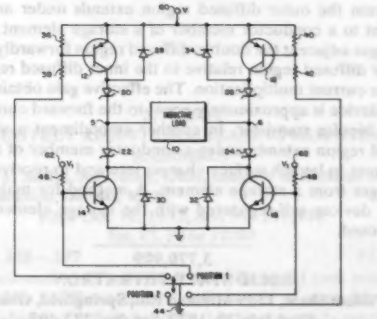
By applying to a current operated threshold device the sum of a constant current, a slowly increasing bias current, and alternately the currents derived from two voltages being compared, the larger of the two voltage derived currents will cross the threshold level first, and at a time prior to the sum of the constant current and bias current being equal to the threshold level. By detecting which derived current is being applied to the threshold device at the time the threshold level is crossed, the relative voltage magnitudes are ascertained, even when they are nearly equal. If a voltage sensitive threshold device is employed, its inputs would all be voltages rather than currents.

3,770,986

SWITCHING CIRCUIT FOR INDUCTIVE LOADS

James R. Drehle, Fort Collins, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 20, 1972, Ser. No. 245,997
Int. Cl. H03k *1/00*
U.S. Cl. 307—270 **2 Claims**



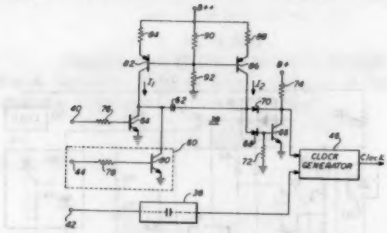
An inductive load is connected across a bridge circuit comprising four switching elements.

3,770,987

EXTENDED RANGE CAPACITIVE TIMING CIRCUIT

William McSweeney, Plainfield, N.J., assignor to Litton Business Systems, Inc., Norristown, N.J.

Filed Mar. 30, 1972, Ser. No. 239,457
Int. Cl. H03k 17/26
U.S. Cl. 307—293 2 Claims



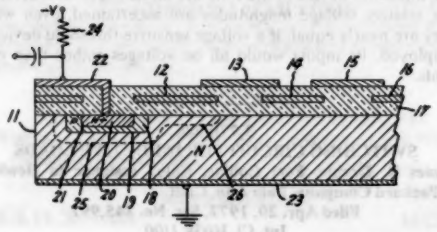
A timing circuit includes two current sources having a constant current ratio and arranged to provide for the charge and discharge of a capacitor in response to a received input signal, operation of the circuit being independent of power supply fluctuations.

3,770,988

SELF-REGISTERED SURFACE CHARGE LAUNCH-RECEIVE DEVICE AND METHOD FOR MAKING

William E. Engeler, Scotia, and Jerome J. Tiemann, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sept. 4, 1970, Ser. No. 69,649
Int. Cl. H01l 11/14
U.S. Cl. 307—304 7 Claims



A device for launching, receiving and amplifying surface charges from a conductor-insulator-semiconductor (CIS) structure and a method for making the device are disclosed. In one embodiment the device includes a double-diffused region wherein the outer diffused region extends under and is adjacent to a conductor member of a storage element. Surface charges adjacent the double-diffused region forwardly bias the outer diffused region relative to the inner diffused region and cause current multiplication. The effective gain obtained from this device is approximately equal to the forward current gain of a bipolar transistor. In another embodiment a single diffused region extends under a conductor member of a storage element to launch surface charges into and to receive surface charges from a storage element. A method for making both type devices self-registered with the storage element is also disclosed.

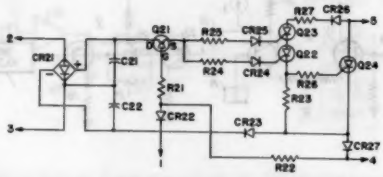
3,770,989

SOLID STATE THYRATRON

D. William Shaw, 1339 Midland Rd., Springfield, Ohio

Filed July 20, 1972, Ser. No. 273,493
Int. Cl. H03k 17/72
U.S. Cl. 307—305 14 Claims

A solid state replacement device for a thyratron is mounted on a base having pins which correspond to the pins of the thyratron. The replacement device provides response characteristics on the base pins which are substantially the same as



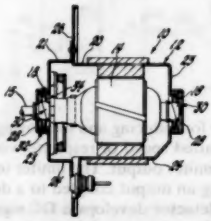
those provided by the corresponding thyratron, enabling the invention to be plugged into the thyratron socket as a replacement therefor.

3,770,990

CLEARANCE TAKE UP BEARING ASSEMBLY

Herbert E. Winkelmann, Kettering, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 21, 1972, Ser. No. 282,416
Int. Cl. F16c 23/00
U.S. Cl. 308—72 2 Claims

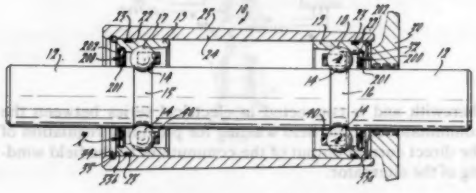


This disclosure relates to a clearance take up bearing assembly for an armature shaft of a dynamoelectric machine. The bearing assembly has a bearing housing with axially spaced retainer means defining a partially enclosed bearing cage. The bearing assembly also includes a split-ring, bearing which has two members. The members have eccentric annular openings with diameters larger than the diameter of the shaft and adjacent, inclined sides which define cam surfaces. The members are normally loosely retained axially and radially within radially retainer means with their cam surfaces in abutting engagement and with their annular openings axially misaligned. One of the members normally supports the lower portion of the shaft within its annular opening and the other of the members, which also has the shaft received within its annular opening, normally rests upon the upper portion of the shaft for rotation thereof. The one member is rotated relative to the other member upon rotation of the shaft, whereupon the members are moved axially apart by the cam surfaces and the support means of the bearing housing restrains the members axially and readially and urges the members into engagement with the different circumferential portions of the shaft to radially support the shaft during rotation thereof.

3,770,991
HIGH SPEED AIR PRESSURE SENSITIVE SEAL AND BEARING SYSTEM

Eli M. Ladin, Ann Arbor, Mich., assignor to Federal-Mogul Corporation, Southfield, Mich.

Filed Feb. 29, 1972, Ser. No. 230,305
Int. Cl. F16c *33/78*
U.S. Cl. 308—187.1 **6 Claims**



A double row bearing assembly which contains a special air pressure sensitive seal and a shaft supported by the bearing assembly with the shaft in operating usage being rotated at very high speeds.

3,770,992
BEARING HAVING CLOSURE MEANS FOR CLOSING THE BEARING SEATING

Bartolomeo Veglia, Turin, Italy, assignor to Rin SKF Officine Di Villar Perosa S.p.A., Turin, Italy

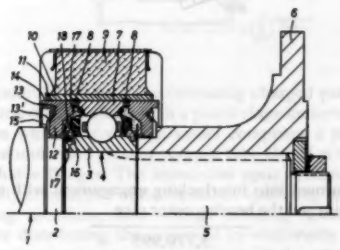
Filed Feb. 28, 1971, Ser. No. 229,681
Int. Cl. F16c *33/78*
Claims priority, application Italy, Apr. 10, 1971, 68212A/71
U.S. Cl. 308—187.2 **3 Claims**

A rolling element bearing having a sealing cover for closing the opening in a casing or housing in which the bearing is mounted to prevent the leakage of lubricant and to protect the bearing from dust and other foreign bodies. The cover is substantially disc like and has an annular rim which clips over the outer annular bearing member of the bearing and engages in an annular groove in the curved surface thereof. The cover also has a central portion slightly axially displaced from a peripheral portion so that no rubbing against the inner annular bearing element occurs when the bearing is in use, but the central portion is resiliently movable with respect to the peripheral portion so that the cover can be assembled to the bearing before the bearing is pressed onto a shaft so that the force can be applied through the central portion of the cover which moves to engage the inner bearing element during this operation and then returns to the normal position spaced from the inner bearing member.

3,770,993
SEALING SYSTEM FOR A ROLLER BEARING OR THE LIKE

Josef Schultenkamper, Essen, Germany, assignor to Gelenkwellenbau GmbH, Essen, Germany

Filed May 3, 1972, Ser. No. 249,770
Claims priority, application Germany, May 3, 1971, P 21 21 816.6
Int. Cl. F16c *33/78, 33/80*
U.S. Cl. 308—187.2 **5 Claims**



Sealing system for an antifriction bearing having an inner and an outer bearing race and a ring of rolling members disposed therebetween, includes lip seals respectively disposed adjacent to and on opposite sides of the ring of rolling members, respective labyrinth seals spaced outwardly from the lip seals and sealing the bearing at opposite sides thereof from the outside, a supply of lubricant received in the space between the respective lip seals and labyrinth seals, and respective disc members located adjacent the inner bearing race of the bearing and extending radially outwardly into the spaces wherein the lubricant is received.

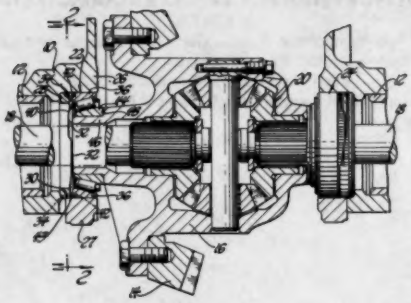
3,770,994
INFINITELY ADJUSTABLE BEARING MOUNTING ASSEMBLY

Claude A. Smith, Sandusky, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 16, 1972, Ser. No. 297,916
Int. Cl. F16c *19/00*
U.S. Cl. 308—207 **3 Claims**

An automotive differential has a differential case rotatably mounted in a differential carrier by a pair of spaced bearing means which are infinitely adjustable to accurately center the differential case in the differential carrier. Each of the bearing means are adjustable by virtue of a shim having ramps on one face which engage cooperating ramps on the outer race of a tapered roller bearing having a thrust capacity in one

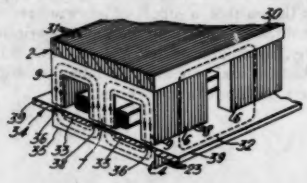
direction. Adjustment is effected by relative rotation between the shim and the outer race and is maintained by an arcuate strip deformed into interlocking engagement with serrations on the shim and the bearing outer race.



3,770,995
LINEAR INDUCTION MOTOR

John Frederick Eastham, Long Ditton, and Hugh Robert Bolton, London, both of England, assignors to Tracked Hovercraft Limited, London, England

Continuation of Ser. No. 73,107, Sept. 17, 1970, abandoned. This application Apr. 4, 1972, Ser. No. 241,069
Claims priority, application Great Britain, Sept. 18, 1969, 46074/69
Int. Cl. H02k *91/09*
U.S. Cl. 310—13 **15 Claims**



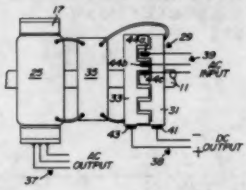
A linear induction motor has propulsive force produced in the electrically conductive reaction member forming part or all of its secondary member by flux which passes in the primary-secondary magnetic structure in both transversely orientated and longitudinally orientated magnetic laminations.

3,770,996
REGULATED COMMUTATED ALTERNATOR

James R. Cherry, Barrington, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Sept. 23, 1971, Ser. No. 183,188
Int. Cl. H02k *11/00*
U.S. Cl. 310—68 D **3 Claims**

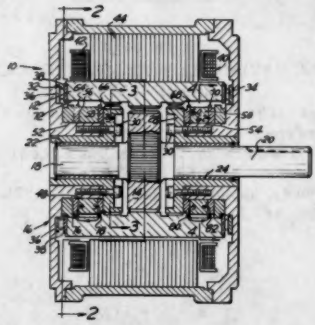
A commutated alternator having a direct current excitable field winding mounted on a rotating shaft and useful for generating alternating current output from an electrical stator, includes a rotatable commutator mounted on the shaft for rectifying the alternating current output of the stator to direct current. A regulator is mounted on the shaft for rotation therewith and is connected in electrical series between the commutator and the field winding for providing regulation of the direct current output of the commutator to the field winding of the alternator.



3,770,997
ROTARY ACTUATOR

Rex W. Presley, Livonia, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Aug. 24, 1971, Ser. No. 174,342
Int. Cl. H02k *7/10*
U.S. Cl. 310—82 **6 Claims**



A rotary actuator of the type in which an eccentrically positioned floating rotor is orbited about the axis of an output member drivingly engaged therewith and adapted to be driven by the rotor orbiting motion, featuring an arrangement providing magnetic forces acting on the rotor so as to maintain the output member and rotor in engagement as the rotor orbits about the output member axis, taking the form of permanent ring magnets disposed to create a toroidal magnetic field about the output member axis so as to magnetically attract the rotor in a direction to maintain its engagement with the output member as it orbits about the output member axis.

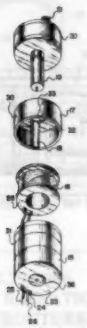
3,770,998
ELECTRIC ROTATING MACHINE

Arthur W. Haydon, Middlebury, and John J. Dean, Oxford, both of Conn., assignors to Tri-Tech, Inc., Waterbury, Conn.

Filed Aug. 25, 1972, Ser. No. 283,804
Int. Cl. H02k *21/16*
U.S. Cl. 310—156 **16 Claims**

A small, round synchronous motor including a permanent magnet rotor and only a single salient stator pole in magnetic flux relationship with the rotor. Upon the energization of the field coil for the motor, at any given moment the stator pole is

of one polarity. When the field coil is de-energized, the rotor consistently assumes a position with respect to the stator pole



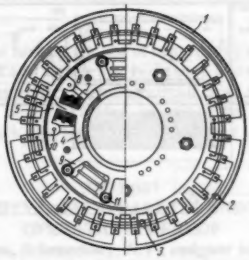
in which the rotor poles are displaced from the center of the stator pole so that, when the coil is again energized, the rotor is self-starting.

3,770,999

APPARATUS FOR CONTROL OF THE ROTARY RECTIFIER OF A SYNCHRONOUS MACHINE

Geley Alexeevich Kovalkov, Leningradsky prospekt, 26, kv. 174, and Olga Vladimirovna Veselova, Naberezhmaya M. Gorkogo, 4/22, korpus B, kv. 68, both of Moscow, U.S.S.R.

Filed Mar. 17, 1971, Ser. No. 125,026
Int. Cl. H02k *19/26*
U.S. Cl. 310—165 **4 Claims**



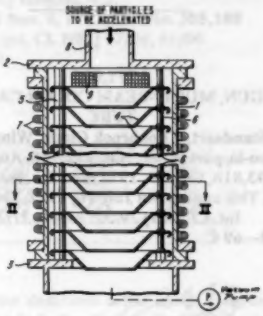
An apparatus for controlling rotary rectifiers of a synchronous machine, which has an exciter in the form of a polyphase a.c. generator based on semiconductor devices and designed to supply the field winding of the machine via the rectifiers. The apparatus ensures contactless generation of peak-shaped e.m.f. pulses in the control circuits of the semiconductor devices of the rectifier, distributed in time and number according to the number of phases and semiconductor devices of the rectifier and having the required slope, on/off time ratio and controlled phase of each pulse with respect to the supply voltage of the corresponding phase of the rectifier. The apparatus is designed as a polyphase pulse generator having a stator with non-salient poles and distributed field windings which are electrically perpendicular to one another, and a rotor with teeth whose heads have a maximum cross-sectional area and roots have a minimum cross-sectional area, with windings provided thereon and connected to the control circuits of the semiconductor devices of the rectifier.

3,771,000

VACUUM TUBE FOR ACCELERATING CHARGED PARTICLES, SUCH AS ELECTRONS OR IONS, BY HIGH ELECTRIC DIRECT VOLTAGES

Kurt Willutzki, Sieben-Hofe-Str. 91, 74 Tubingen Derendingen, Germany

Filed June 5, 1972, Ser. No. 259,587
Claims priority, application Germany, June 4, 1971, P 21 27 697.1
Int. Cl. H05h *5/00*
U.S. Cl. 313—63 **7 Claims**



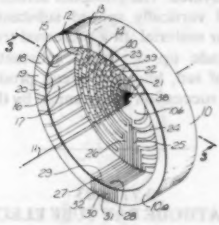
An acceleration tube for accelerating charged particles by high electric direct voltage with a plural stage immersion optic system, in which the vacuum vessel comprises a preferably cylindrical undivided glass or ceramic tube closed at both ends by detachable flanges. The immersion optic system includes metallically conductive optic elements, insulating spacer and connecting members, and voltage dividing resistor chain means for distributing the potential in conformity with the respective requirements among said individual optic elements, said immersion optic system being adapted after disengagement of one of said flanges to be removed from and to be installed in said vessel as an entirety.

3,771,001

FLAT PANEL CATHODE RAY TUBE PARTICULARLY ADAPTED FOR RADAR DISPLAYS

Hemmo R. Alting-Mees, Granada Hills, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Dec. 2, 1971, Ser. No. 204,233
Int. Cl. H01j *29/50, 31/12*
U.S. Cl. 313—68 R **8 Claims**



A flat panel cathode ray display in which a phosphor screen is selectively excited from an area cathode through a multichannel flat panel electron multiplier array. Electrons are permitted to flow substantially only through one hole of the multichannel array at a time as controlled by separate radial and circumferential scan components. The holes of the multichannel array are arranged in substantially concentric circles and also in radial lines, and a system of conductive strips provides a gating potential distribution means to effect sequenc-

ing of the required pattern of electron flow through the multichannel array holes. The aforementioned holes are through the bottom of a pan-shaped insulating body, the extensions of the radial and circular conductive strips overlapping the holes being drawn up over the insides of the pan-shaped body side flanges or walls. Separate electron beam scanning means for the conductive extensions of the circular and radial strips are provided by electron beam scanning means around selected portions of the inside surface of the side flange. Secondary emissive material on the individual conductive extensions provides a switching or gating effect during scanning electron beam impingement.

3,771,002

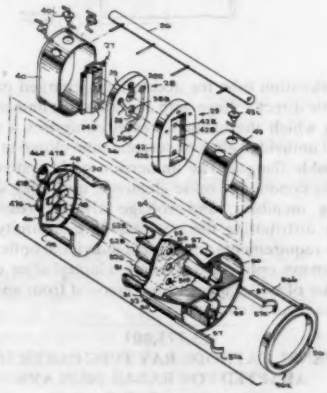
SINGLE GUN, MULTI-BEAM COLOR CATHODE RAY TUBE

Adrian W. Standaart, 5 Bonbrook Circle, Winston-Salem, N.C.

Continuation-in-part of Ser. Nos. 172,756, Aug. 18, 1971, and Ser. No. 193,818, Oct. 29, 1971, and Ser. No. 201,460, Nov. 23, 1971. This application July 18, 1972, Ser. No. 272,795

Int. Cl. H01j *29/32, 29/48, 31/20*

U.S. Cl. 313—69 C **26 Claims**



A cathode ray tube which produces plural beams from a single electron gun having a single cathode and having a control grid and a first anode each of which have at least three beam apertures arranged for example to produce three vertically spaced beams. Focus and accelerating anodes for the plural beams are also provided. The phosphor screen area is made up of plural parallel vertically spaced substantially horizontal bands of phosphor material. In a preferred tri-color example, each band is made up of three, substantially horizontal phosphor strips of red, blue and green producing phosphor spaced in vertical succession and scanned by the three beams.

3,771,003

SHIELDED CATHODE RAY TUBE ELECTRON GUN

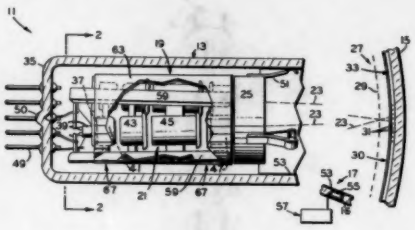
Jacob E. Kerr, and Joseph D. Reardon, both of Seneca Falls, N.Y., assignors to GTE Sylvania Incorporated, Seneca Falls, N.Y.

Filed May 25, 1972, Ser. No. 256,642

Int. Cl. H01j *29/50*

U.S. Cl. 313—70 C **8 Claims**

An improved electron gun structure is provided for use in a cathode ray tube wherein insulative shielding is arranged to substantially encompass at least a portion of the plural electrode arrangement of the gun assembly. Such shielding, being dimensioned to be spaced from the interior surface of the envelope neck portion, is suitably positioned and retained relative to the support rods of the gun structure in a manner that



the shielded gun assembly is inserted as a unit into the envelope neck portion during tube fabrication.

3,771,004

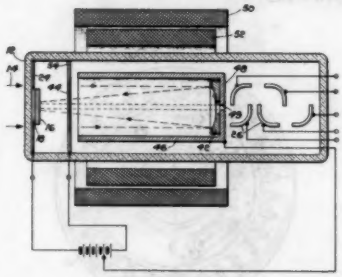
REFLECTIVE MULTIPLIER PHOTOTUBE

Charles A. Plumeau, Plano, Tex., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Feb. 2, 1972, Ser. No. 222,782

Int. Cl. H01j *39/16, 43/02*

U.S. Cl. 313—95 **4 Claims**



A multiplier phototube includes a light reflective photocathode on a faceplate at one end and a reflective surface adjacent the electron multiplier at the other end to provide a tube of increased sensitivity and efficiency. The structure may be incorporated in an image dissector tube having an accelerating mesh adjacent the photocathode, a cylindrical anode between the mesh and multiplier and a scanning aperture plate at the entrance to the multiplier, with the reflective surface within the anode.

3,771,005

OMNIDIRECTIONAL ULTRAVIOLET RADIATION DETECTOR

Clifford W. Erickson, Minnetonka, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

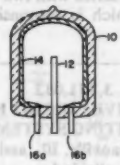
Filed Oct. 12, 1971, Ser. No. 188,398

Int. Cl. H01j *39/06*

U.S. Cl. 313—101 **8 Claims**

An ultraviolet sensitive gaseous discharge detector has essentially uniform angular sensitivity in a plane perpendicular

to the axis of the detector tube and in the plane of the detector tube axis. The cathode of the detector is in the form of a thin



sputtered layer of metal adhering to the inner wall of the envelope of the detector.

3,771,006

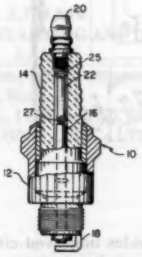
IGNITION CIRCUIT RADIATION SUPPRESSION STRUCTURE

Norman H. Berry, 49 Cambridge, Pleasant Ridge, Mich.

Filed Feb. 14, 1972, Ser. No. 226,042

Int. Cl. H01t *13/02*

U.S. Cl. 313—118 **3 Claims**



A wire wound resistor for use in suppressing ignition circuit radiation which has a very low resistance and a specified inductance connected in an ignition circuit close to and in series with the spark plug electrodes, as within the spark plug or between the spark plug lead wire and the spark plug.

3,771,007

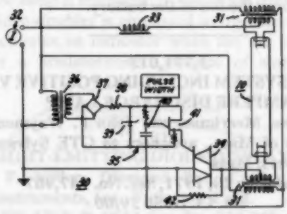
HIGH INTENSITY LAMP APPARATUS AND METHOD OF OPERATION THEREOF

Peter D. Johnson, Schenectady, N.Y., assignor to General Electric Company, New York, N.Y.

Filed Oct. 15, 1970, Ser. No. 80,896

Int. Cl. H01j *17/20*

U.S. Cl. 313—183 **7 Claims**



Describes photochemical and fluorescent lamp apparatus including means for providing a far U.V. ionic radiation emitting discharge, the intensity of which varies as a superlinear function of discharge current, and means for exciting the discharge source with a shaped current waveform. The use of a shaped current waveform permits operation at higher instantaneous currents without increasing average cathode or wall loading and results in greatly increased intensity of lamp output.

3,771,008

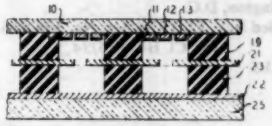
GASEOUS DISCHARGE DISPLAY DEVICE

Yen-Sun Chen, New Providence; Hatsuaki Fukui, Summit; Eugene Irving Gordon, Convent Station; Dan Charles Krupka, Summit, and John Howard Rowen, Florham Park, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Berkeley Heights, N.J.

Filed Nov. 9, 1972, Ser. No. 305,188

Int. Cl. H01j *17/04, 61/06*

U.S. Cl. 313—218 **14 Claims**



The specification describes a flat panel gaseous discharge display device in which the display illumination is formed at least in part by luminescence resulting from excitation of an appropriate phosphor by low energy electrons drawn from a glow discharge. To provide scan, the discharge is either itself moving in stepwise fashion between discrete cells or is a secondary discharge primed by a scanning discharge and triggered by the display information signal. Varying the current through the phosphor produces gray scale. Illumination from the gaseous discharge may be mixed with the phosphor for color balance and increased brightness. The phosphor can be divided into color stripes with means for selective energization of the stripes to form a color display.

3,771,009

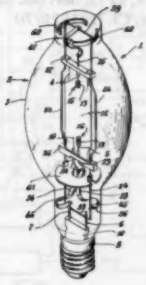
ELECTRODE DISCHARGE DEVICE WITH ELECTRODE-ACTIVATING FILL

H. Graham Silver, Kings Port, N.Y.; Adam Heller, Sharon, Mass.; Phillip J. Gardner, Bayside, N.Y., and Gary R. Argue, Winchester, Mass., assignors to GTE Laboratories Incorporated, Bayside, N.Y.

Filed Dec. 27, 1971, Ser. No. 212,458

Int. Cl. H01j *61/18*

U.S. Cl. 313—228 **25 Claims**



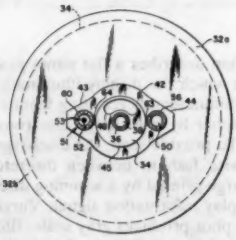
An electric discharge device comprising a sealed light-transmissive envelope having a pair of electrodes spaced therein, and a quantity of material within the envelope for facilitating an arc discharge between the electrodes, the quantity of material including, as the primary light-emitting material, at

least one high melting, relatively non-volatile metallic iodide complexed with an iodide of a Group IIIA element to give a volatile complex having the general formula LnM_xI_{3x+3}, where Ln represents a lanthanide element or a Group IIIB element; M represents a Group IIIA element selected from the group consisting of boron, aluminum, indium and gallium, particularly aluminum; and $x = 3$ to 4. The use of this complex eliminates the need to use a heating element adjacent to but outside the sealed envelope to maintain sufficient amounts of the metallic iodide in the vaporous state, but, in addition and quite unexpectedly, it has been found that its use eliminates the need to pre-activate the spaced electrodes with an electron-emissive material, such as thorium.

3,771,010
LIQUID COOLED BAND EDGE OSCILLATION PREVENTION FOR A TWT

Lester M. Winslow, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 22, 1972, Ser. No. 308,896
Int. Cl. H01j *25/34*
U.S. Cl. 315—3.5 **8 Claims**

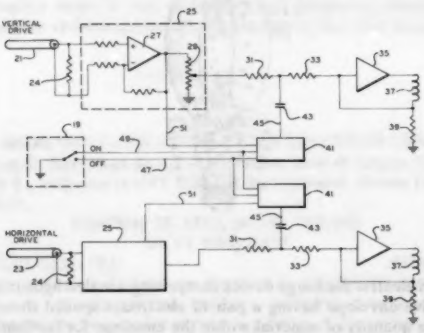


A longitudinally extending liquid cooled attenuator is disposed proximate to and externally of a traveling wave tube coupled cavity slow-wave structure. The attenuator may be a hollow dielectric tube filled with a lossy fluid or a hollow dielectric tube with a lossy solid which is cooled by a moving fluid or a tubular ceramic rod disposed coaxially about an electrically conductive rod. This device lends itself well to the prevention of band-edge oscillations in the coupled cavity traveling wave tube.

3,771,011
APPARATUS FOR SWITCHING INPUTS TO A DEFLECTION SYSTEM

Arnold K. Dietrich, Binghamton, and William H. Nott, both of Kirkwood, N.Y., assignors to the Singer Company, Binghamton, N.Y.

Filed Feb. 4, 1972, Ser. No. 223,609
Int. Cl. H01j *29/70*
U.S. Cl. 315—26 **10 Claims**

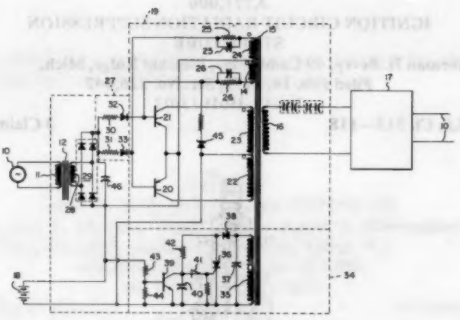


A system for applying scan voltages to and removing said voltages from high power deflection amplifiers in a manner which avoids overloading and damage to the amplifier is shown. Means are provided to detect a zero cross-over and to switch on or off only at or near that point using a switch comprising a diode bridge in series with two transistors controlled by a third transistor which is responsive to the cross-over means.

3,771,012
BATTERY PROTECTIVE CIRCUIT FOR EMERGENCY LIGHTING SYSTEMS

Wayne M. Niederjohn, Danville, Ill., assignor to General Electric Company, Indianapolis, Ind.

Filed May 24, 1972, Ser. No. 256,251
Int. Cl. H05b *37/04*; H02j *9/00*
U.S. Cl. 315—86 **9 Claims**



This invention provides improved circuitry for holding an inverter of an emergency lighting system in an off condition until a normal power source falls below a predetermined voltage level and circuitry to protect a battery from deep discharges when it is called upon to deliver auxiliary power to a lighting system via said inverter. The protective circuitry includes the short circuiting of one of a plurality of windings of a transformer of the inverter upon the battery voltage falling below a predetermined level. The shorting of one winding causes the inverter, which includes other windings of the transformer, to cease oscillation, and therefore substantially cease to draw power from the battery. The battery can thereby recover in substantially unloaded condition, prolonging its useful life.

Means are provided for allowing the battery to repower the inverter when the battery has recovered sufficiently. This results in a cyclical operation of the emergency lighting system causing the lights to flash as the battery recovers and discharges. This recovery and discharge cycle prolongs the operating time of the lighting system when under emergency power and prolongs the life of the battery.

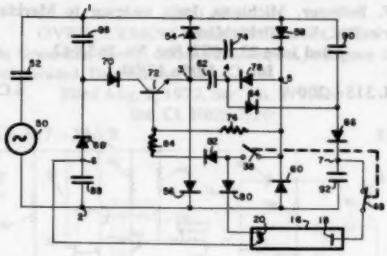
3,771,013
LIGHTING SYSTEM INCLUDING POSITIVE VOLT-AMPERE DISCHARGE LAMP

William J. Roche, Merrimac, and John F. Waymouth, Marblehead, both of Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed May 28, 1971, Ser. No. 147,987
Int. Cl. H05b *39/00*
U.S. Cl. 315—101 **7 Claims**

A lighting system including a fluorescent lamp having a fill gas and pressure characterized by a high electron mobility for providing a static volt-ampere characteristic which includes a substantial region of positive slope. A power supply comprising an AC voltage divider, rectifier and filter capacitor is used to dynamically operate the lamp substantially within the posi-

tive region of its volt-ampere characteristic, and a series connected saturated transistor amplifier maintains the positive



volt-ampere mode of operation by preventing the peak operating current of the lamp from exceeding a predetermined maximum level.

3,771,014

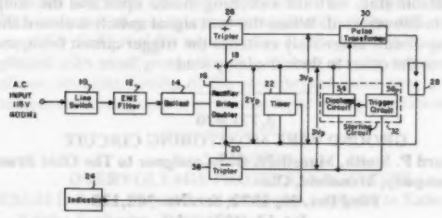
POWER SUPPLY FOR STARTING AND OPERATING ARC LAMPS

Frederick W. Paget, Salem, Mass., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Filed Aug. 31, 1972, Ser. No. 285,195

Int. Cl. H05b *37/04, 41/16*

U.S. Cl. 315—136 **11 Claims**



A power supply for starting and operating metal halide short arc lamps comprising a full wave rectifier bridge and voltage doubler circuit having a capacitive ballast connected on the AC side and a pair of voltage tripler circuits connected at the positive and negative DC terminals of the bridge. The arc lamp is connected across one of the triplers, and a starting circuit for the arc lamp is energized by the other tripler. The output of the bridge-doubler is employed to operate a timing circuit which activates an indicator when the arc lamp fails to operate after a predetermined interval of starting circuit operation.

3,771,015

LIGHT-EMITTING DIODE DISPLAY

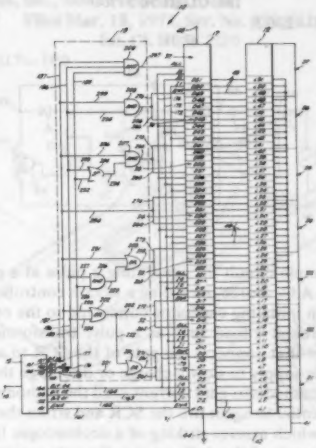
Christopher F. Miller, Diamond Bar, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Feb. 9, 1972, Ser. No. 224,795

Int. Cl. H05b *37/00*

U.S. Cl. 315—169 R **6 Claims**

A visual display adapted to show an analog presentation which represents the value of a measured parameter, in response to coded digital electrical input signals that are proportional to the parameter. In one embodiment a column of energizable light elements is provided, along with logic circuit means for selecting and energizing a series of groups of elements of the column to form a visual display which represents



a numerical value between 0 and 50. In another embodiment the logic circuit is utilized to control, sequentially, three light columns, each having a different scale value.

3,771,016

METHOD FOR DRIVING A PLASMA DISPLAY PANEL

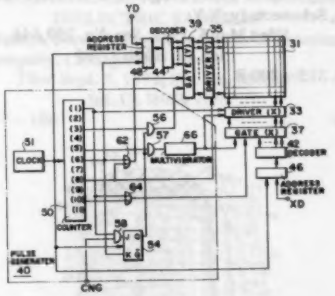
Teruo Toba, Akashi, and Shozo Umeda, Kakogawa, both of Japan, assignors to Fujitsu Limited, Kakogawa, Japan

Filed Mar. 24, 1972, Ser. No. 237,792

Claims priority, application Japan, Mar. 25, 1971, 46/17533

Int. Cl. H05b *37/00*

U.S. Cl. 315—169 TV **9 Claims**

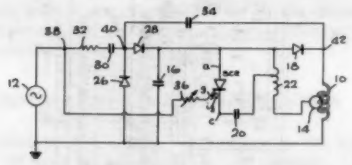


The method and apparatus is disclosed for driving a plasma display panel to invert the state of a discharge cell included in the panel. The state of a selected cell is changed by a preparatory inverting pulse which is applied to a selected column (or row) electrode, and then an inverting pulse is applied to a selected row (or column) electrode to invert the state of the changed cell wall voltage. Thus, semi-selection trouble does not take place according to this invention.

3,771,017
PHASE CONTROLLED FIRING CIRCUIT

Henry N. Switsen, 2319 Montrose Dr., Thousand Oaks, Calif.

Continuation-in-part of Ser. No. 874,098, Nov. 5, 1969, Pat. No. 3,600,996. This application May 17, 1971, Ser. No. 143,881
Int. Cl. H05b *37/00*
U.S. Cl. 315—200 R 14 Claims

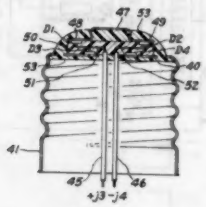


A very simple circuit for generating a pulse at a particular phase of an A.C. source, including a silicon controlled rectifier (SCR), an initiating capacitor connected to the cathode of the SCR through a load such as a pulse transformer, and a large resistor that connects the gate of the SCR to a location on the power supply to slowly charge or discharge the capacitor by SCR cathode-to-gate current until the cathode is of low enough potential to again fire the SCR and strike the lamp. In one circuit which assures striking of a stroboscopic lamp near the positive peak of the A.C. source, the gate resistor is connected to a point of the power source that cyclically varies from a level somewhat below the anode voltage to a much lower voltage, so that the gate reaches a voltage exceeding the cathode voltage near the peak of the A.C. source. In another circuit which assures firing during the negative portion of the A.C. cycle, the resistor is connected to a point of constant low voltage (with respect to the SCR anode) to obtain a largely exponential reduction of cathode voltage. In this circuit, a ripple-producing capacitor is also provided which connects the cathode of the SCR to a terminal of the A.C. source to provide a ripple component that assures that the cathode potential will be lowest during the negative portion of the A.C. cycle and therefore that the gate-to-cathode firing voltage will be attained during a negative phase of the A.C. cycle.

3,771,018
DISCHARGE LAMP CONTAINING BRIDGE RECTIFIER

Nicholas W. Medendorp, Willowick, and William H. Lake, Novelty, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed May 5, 1972, Ser. No. 250,646
Int. Cl. H05b *37/00*
U.S. Cl. 315—200 R 9 Claims

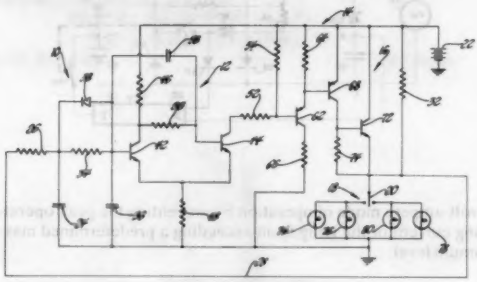


A self-ballasted discharge lamp comprising an arc tube and an incandescible filament connected in series within an outer jacket includes an integral full wave bridge rectifier. The bridge comprises four diodes and optionally one or two ceramic capacitors which are assembled into a screw base of standard external dimensions. Two diodes are heat sunk directly to the center contact of the base while the other two diodes are heat sunk directly to the base shell. This configuration provides excellent heat dissipation characteristics, mechanical strength and simple assembly.

3,771,019
FLASHER CIRCUIT

John F. Bolinger, Michigan, Ind., assignor to Meridan Industries Inc., Southfield, Mich.

Filed June 23, 1972, Ser. No. 265,942
Int. Cl. H05b *37/00*
U.S. Cl. 315—200 A 6 Claims

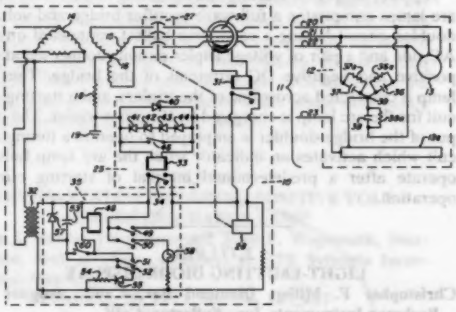


A flasher circuit is disclosed for intermittently energizing a lamp load such as the turn signal lamps of an automotive vehicle. The circuit operates in the manner of a relaxation oscillator and comprises a resistance capacitance timing circuit, a bistable trigger circuit controlled thereby, and a load switching means which in one embodiment is a power transistor and which in another embodiment is a relay switch. In the standby condition the bistable trigger circuit is held in one stable state with the switching means open and the lamp load is deenergized. When the turn signal switch is closed the timing circuit alternately switches the trigger circuit from one state to the other to flash the lamp load.

3,771,020
GROUND WIRE MONITORING CIRCUIT

Edward P. Smith, Mansfield, Ohio, assignor to The Ohio Brass Company, Mansfield, Ohio

Filed Oct. 30, 1972, Ser. No. 302,125
Int. Cl. H02h *3/00*
U.S. Cl. 317—18 C 15 Claims



A ground wire monitoring circuit particularly adapted for use in connection with mining machinery that is supplied wither alternating current through a flexible cable from a power source remote from the machine. The cable contains phase conductors and a ground wire. The ground wire is energized by a voltage derived from the alternating current power

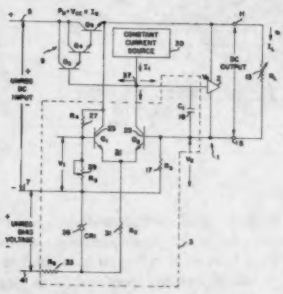
supply at the location of the mining machine and any failure or opening of the ground wire circuit is detected by means adjacent the power source and the power circuit leading to the mining machine is immediately opened.

3,771,021

OVERCURRENT FOLDBACK CIRCUIT

Meade Goodman Bierly, Elizabethtown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 2, 1972, Ser. No. 277,422
Int. Cl. H02h 7/20
U.S. Cl. 317—33 VR 8 Claims



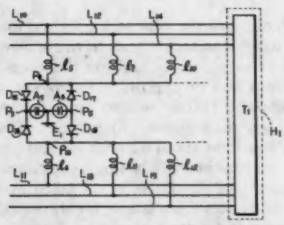
The disclosure relates to an overcurrent foldback circuit for achieving overload and short circuit protection for linear voltage regulator circuits wherein an overcurrent to a load is sensed in a differential amplifier and causes current to be drawn in one side of the differential amplifier. thereby decreasing the reference voltage at the other end of the differential amplifier due to a decrease in the output voltage. This causes even greater current conduction in the differential amplifier and provides regenerative foldback. This is accomplished with small power loss in a current sensing resistor and allows accurate setting of the overcurrent point over a wide temperature range and over a wide input voltage variations.

3,771,022

OVERVOLTAGE PROTECTIVE CIRCUIT

Chiaki Isokawa, Sagamihara-shi, Japan, assignor to Kabushiki Kaisha Sankosha, Tokyo, Japan

Filed Feb. 12, 1973, Ser. No. 331,523
Claims priority, application Japan, Feb. 20, 1972, 47/017382; Mar. 4, 1972, 47/022487; Apr. 13, 1972, 47/036435
Int. Cl. H02h 3/22
U.S. Cl. 317—52 6 Claims



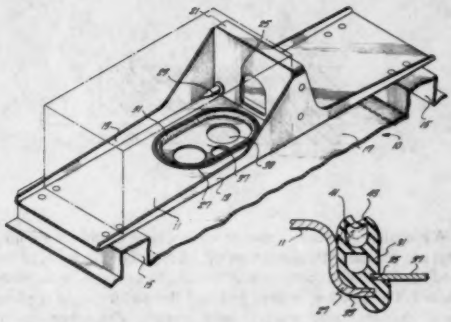
A first pair of oppositely poled diodes are connected in series across at least one pair of lines along which a signal is transmitted to an equipment to be protected. A second pair of reversely poled diodes are connected in series across the lines. Overvoltage responsive elements are connected between the respective junctions of the series diodes in the respective groups and the ground.

3,771,023

AVIONIC TRAY AND DETACHABLE METERING PLATE CONTROLLING AIR FLOW TO AN ELECTRONIC INSTRUMENT WITH COOLING METERING PLATE

Robert A. Hollingsead, Yorba Linda, and Clyde Robert Pryor, Anaheim, both of Calif., assignors to Hollingsead-Pryor Enterprises, Inc., Santa Fe Springs, Calif.

Filed Mar. 18, 1971, Ser. No. 125,561
Int. Cl. H05k 7/20
U.S. Cl. 317—100 14 Claims



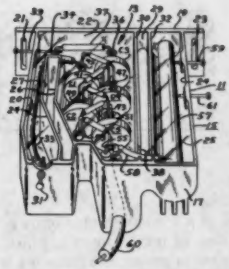
An avionic tray is disclosed for supporting electronic instruments on a shelf. The tray includes an aperture formed thereon for providing the supported instrument with communication to an air plenum chamber. An interchangeable metering plate is adapted to extend over the aperture, with the plate having a predetermined number of metering ports formed thereon in any desired arrangement. The metering plate is interconnected to the aperture by means of a removable annular gasket, which in turn sealingly engages a surface of the electronic instrument. The gasket includes a pair of annular grooves for receiving the peripheral edges of the metering plate and the tray aperture. The gasket is constructed in such a manner that any application of a downward or lateral force on the gasket by the supported instrument causes the metering plate to be forced against the tim of the aperture to tightly hold the portion of the gasket between the two elements and prevent the gasket from becoming disengaged.

3,771,024

MULTIPLIER ASSEMBLY WITH AIR AND MATERIAL DIELECTRIC BARRIERS

Christ J. Dumas, Forest View, Ill., assignor to American Plasticraft Company, Chicago, Ill.

Filed Sept. 5, 1972, Ser. No. 286,237
Int. Cl. H05k 7/20
U.S. Cl. 317—100 8 Claims

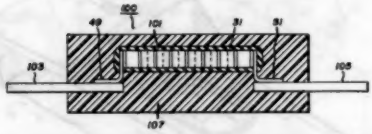


An electronic multiplier assembly for high voltage application which provides improved dielectric and thermal characteristics.

3,771,025
SEMICONDUCTOR DEVICE INCLUDING LOW IMPEDANCE CONNECTIONS

Warren E. Berner, Camillus, N.Y., assignor to General Electric Company

Filed Oct. 2, 1969, Ser. No. 863,210
Int. Cl. H01l 3/00, 5/00
U.S. Cl. 317—234 R 5 Claims

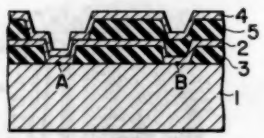


A plurality of semiconductor wafers each containing a junction are plated with aluminum on an N conductivity type surface and stacked between P conductivity type attachment wafers. The stack is heated to bond the wafers, gold is plated onto the endmost wafers, and excess aluminum at the periphery of the stack is removed. The wafer stack is subdivided first into slabs and then the slabs repositioned to close the kerf formed by sawing. The repositioned slabs are then subdivided into unitary dice stacks. The unitary dice stacks are then attached to gold coated leads and freed of surface contaminants by flow etching. The cleaned unitary dice stacks are separately protectively encapsulated to form completed rectifiers by first depositing a passivant over the semiconductive surfaces and then molding a plastic housing around the elements.

3,771,026
CONDUCTIVE REGION FOR SEMICONDUCTOR DEVICE AND METHOD FOR MAKING THE SAME

Shojiro Asai, and Eiichi Maruyama, both of Tokyo, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 25, 1971, Ser. No. 128,069
Claims priority, application Japan, Mar. 25, 1970, 45/24405
Int. Cl. H01l 7/00
U.S. Cl. 317—234 R 4 Claims

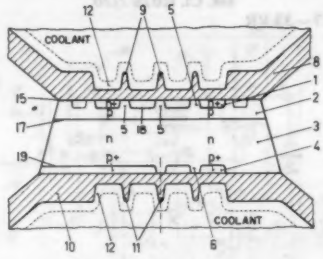


Two portions of a semiconductor body are connected with each other by way of transformed regions, transformed into the crystalline state in parts corresponding to the two portions respectively of a first amorphous semiconductor, and by way of a further transformed region transformed into the crystalline state, in a second amorphous semiconductor layer formed on the first amorphous semicondcutor layer.

3,771,027
BISTABLE SEMICONDUCTOR DEVICE

Alois Marek, Nussbaumen, Switzerland, assignor to Brown, Boveri & Company Limited, Baden, Switzerland

Filed Nov. 1, 1971, Ser. No. 194,403
Claims priority, application Switzerland, Nov. 2, 1970, 16184/70
Int. Cl. H01l 11/10
U.S. Cl. 317—235 R 14 Claims

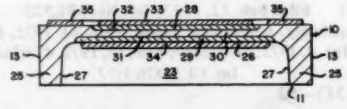


The present bistable semiconductor device has at least three junctions. At least one of the outer junctions is interrupted by short circuit means hereafter referred to as shorting areas on simply shortings which extend, preferably as narrow strips, through the semiconductor zone located adjacent to main electrode means of the device, whereby the shorting areas extend substantially in parallel to the direction of propagation of the conductive state which starts at and extends from a gate electrode in response to a control pulse applied to said gate electrode.

3,771,028
HIGH GAIN, LOW SATURATION TRANSISTOR

John R. Davis, Export, and Surinder Krishna, Greensburg, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 26, 1972, Ser. No. 257,088
Int. Cl. H01l 5/00
U.S. Cl. 317—235 R 7 Claims



A high current transistor with high gain and low power loss is provided in a semiconductor body having a membranous internal portion of substantially uniform thickness of less than about 60 microns and of oppositely facing surfaces each of greater than about 0.10 cm^2 in area, and a thick peripheral portion of greater than about 150 microns. Thus a narrow base region of less than about 52 microns and preferably less than about 20 microns in width having a substantially uniform, precisely dimensioned thickness is provided at the internal portion of the body between shallow, highly doped, preferably conjugate emitter and collector regions. Ohmic contacts are made to the collector and emitter regions at the opposite surfaces of the internal portion, and ohmic contact is made to the base region at the peripheral portion of the semiconductor body.

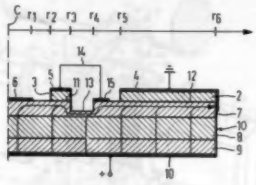
Preferably the transistor is made by a method involving deep etching of the semiconductor body after electroplating an etchant resistant coating onto selected surface portions of the body.

3,771,029

THYRISTOR WITH AUXILIARY EMITTER CONNECTED TO BASE BETWEEN BASE GROOVE AND MAIN EMITTER

Joachim Burtscher; Karl-Peter Frohmader; Alfred Porst, and Peter Voss, all of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Aug. 15, 1972, Ser. No. 280,822
Claims priority, application Germany, Aug. 19, 1971, P 21 41 627.3
Int. Cl. H01l *11/00, 15/00*
U.S. Cl. 317—235 R 18 Claims



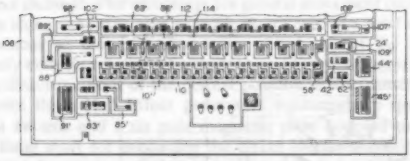
A thyristor wherein a groove is positioned in a base between an auxiliary emitter and a main emitter. The groove causes an increased resistance for current flowing parallel to the upper pn junction when breakover triggering is initiated. Thus, the voltage drops at the pn junction of the auxiliary thyristor so that it is triggered while the voltage at the pn junction of the main thyristor remains below its gating voltage. The load current of the auxiliary thyristor forms a relatively high triggering or gating current for the main thyristor causing it to trigger linearly and/or laminar-like. The auxiliary thyristor is protected from high specific stresses by a fast current transfer onto the main thyristor.

3,771,030

LARGE SCALE INTEGRATED CIRCUIT OF REDUCED AREA INCLUDING COUNTER

Gilbert Barrie, 1885 S.W. Cedar Hills Blvd., Portland, Oreg.

Continuation of Ser. No. 845,286, July 28, 1969, abandoned.
This application Jan. 26, 1972, Ser. No. 220,997
Int. Cl. H01l *19/00*
U.S. Cl. 317—235 R 9 Claims



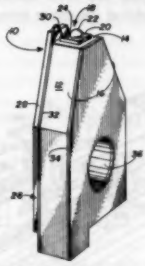
An integrated circuit including four digital decade ring counters, four buffer storage circuits and four digital to analog converters is described in which each counter and associated storage circuit is provided within one epitaxial region surrounded by a single isolation region to greatly reduce the required semiconductor area. The counter includes a plurality of NPN transistors having common collectors provided by portions of the epitaxial region and a plurality of PNP transistors having common bases provided by other portions of such epitaxial region. Interconnections between NPN and PNP transistors are made through the epitaxial region including collector to base interconnections under which a plurality of buried layer regions are selectively diffused to lower their resistances. In addition, the PNP counter transistors are each provided with three separate collectors to simplify the counter.

3,771,031

HEADER ASSEMBLY FOR LASERS

David B. Kay, Irving, Tex., assignor to Texas Instruments Incoporated, Dallas, Tex.

Continuation of Ser. No. 880,877, Nov. 28, 1969, abandoned.
This application Mar. 5, 1973, Ser. No. 337,815
Int. Cl. H01l *11/00, 15/00*
U.S. Cl. 317—235 R 9 Claims



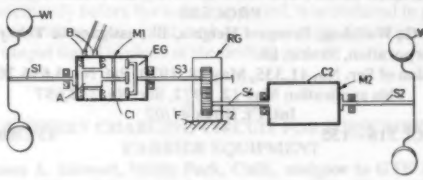
A header assembly includes a header and a connector both formed from an electrically and thermally conductive material. One or more light emitting members are mounted on the header and are connected between the header and the connector. In use, pluralities of aligned header assemblies are mounted adjacent each other to form sets of header assemblies. The sets are in turn positioned around a laser rod with the light emitting members of the header assemblies facing the rod.

3,771,032

PLURAL ELECTRIC MOTOR CONTROL SYSTEMS

Berkeley Stephens Hender, Abergavenny, England

Filed June 7, 1972, Ser. No. 260,431
Int. Cl. H02p *5/46*
U.S. Cl. 318—8 7 Claims



An electric motor control system, in which: two coacting electric motors, each having a rotatable armature and rotatable casing and field assemblies, are arranged to afford infinitely-variable speed-control of members driven by them jointly; and the motors are interconnected mechanically and electrically in such manner that, by operation of electrical control means in circuit with the motors, their respective armatures and field assemblies are enabled to rotate at different speeds and, during part of the acceleration and deceleration phases of operation, in opposite directions relative to each other.

3,771,033

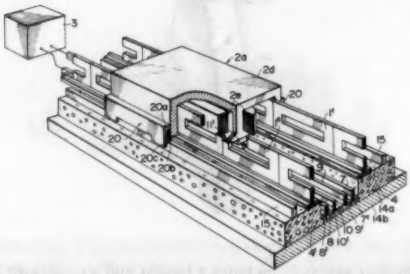
APPARATUS FOR PROPELLING A MOVABLE BODY IN A SUSPENDED STATE AT A VERY HIGH SPEED

Kazumi Matsui, and Takashi Umemori, both of Tokyo, Japan, assignors to Japanese National Railways

Filed July 6, 1971, Ser. No. 159,852
Claims priority, application Japan, July 7, 1970, 45/58720; Sept. 25, 1970, 45/83420; Sept. 25, 1970, 45/83421
Int. Cl. H02k *41/02*
U.S. Cl. 318—135 16 Claims

The present invention has to do with a method for propelling a movable body suspended along a set path at a

very high speed. Along the path of the movable body, fixed armature windings consisting of rectangular current loops are continuously arranged adjacent to one another in vertical direction to the ground. Power supply mechanisms to supply d-c successively to the movable body as it moves on are provided on said fixed armature windings. The movable body is mounted on a movable magnetic field. The movable magnetic field is generated by a permanent magnet or an electromagnet which produces a magnetic flux cutting across the conductors



of the fixed armature windings, which is perpendicular to the current loop of the fixed armature windings, said conductors being perpendicular and parallel to the ground. A relative lift is created between the conductor, parallel to the ground, of the fixed armature winding and the movable magnetic field, while at the same time a relative drive is created between the conductor, perpendicular to the ground, of the fixed armature winding and the movable magnetic field, thereby the movable body can be propelled in a suspended state.

3,771,034

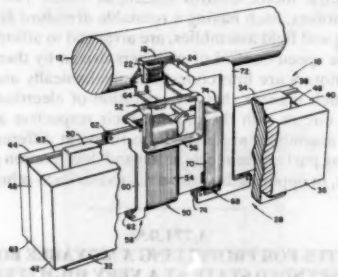
LINEAR ELECTRIC MOTOR AND DISPLACEMENT PROCESS

Alan G. Wallskog, Prospect Heights, Ill., assignor to Teletype Corporation, Skokie, Ill.

Division of Ser. No. 41,335, May 28, 1970, Pat. No. 3,696,204. This application May 12, 1972, Ser. No. 252,697

Int. Cl. H02k *41/02*

U.S. Cl. 318—135 **13 Claims**



A pair of electrical coils are constrained for movement in different directions in the flux field of a magnet and are coupled together for producing a combined output in a single path responsive to the simultaneous magnetomovement of the coils.

3,771,035

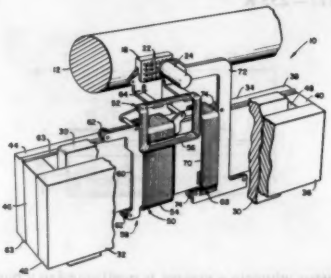
PLURAL LINEAL MOVEMENT SYSTEM AND PROCESS

Gerhard Cless, Skokie, Ill., assignor to Teletype Corporation, Skokie, Ill.

Division of Ser. No. 41,485, May 28, 1970, Pat. No. 3,696,204. This application May 15, 1972, Ser. No. 253,606

Int. Cl. H02k *41/02*

U.S. Cl. 318—135 **10 Claims**



A pair of electrical coils, which are disposed in a magnetic flux field, are constrained for movement in intersecting paths in a plane. A mechanical coupling assembly has a first part connected to one of said coils and to a second part of said assembly. The other of said coils is connected to said second part. A displaceable member is also connected to said second part and has a single position in a plane for each combination of positions of the coils along their respective paths.

3,771,036

BATTERY POWERED VEHICLE TRACTION SYSTEM

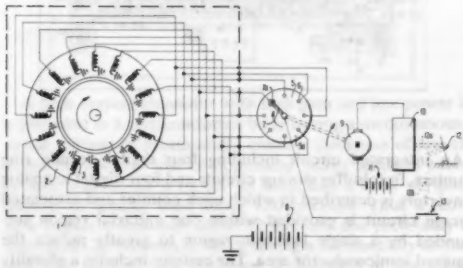
Alberto Roggero, Giaveno (Turin), Italy, assignor to FIAT Societa per Azioni, Turin, Italy

Continuation-in-part of Ser. No. 5,429, Jan. 23, 1970, abandoned. This application Oct. 11, 1972, Ser. No. 296,697

Claims priority, application Italy, Jan. 7, 1972, 67045 A/72; Feb. 3, 1969, 854210/69

Int. Cl. H02p *5/00*

U.S. Cl. 318—139 **5 Claims**

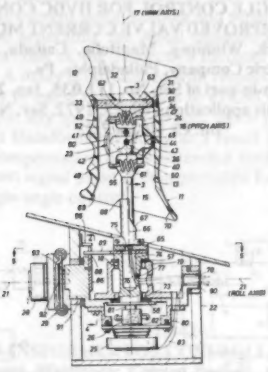


A battery powered vehicle traction system has an asynchronous traction motor the stator coils of which are energized in sequence, in opposed pairs, from a battery source through a rotary distributor. The distributor is driven, at a speed determined by a control member — e.g., the accelerator pedal - by an auxiliary motor powered from the same battery source or from an auxiliary battery.

3,771,037
SOLID STATE CONTROLLER THREE-AXES CONTROLLER

Charles L. Bailey, Jr., Pasadena, Tex., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 15, 1973, Ser. No. 341,662
Int. Cl. B64c *13/16*; G05d *1/00*
U.S. Cl. 318—580 **10 Claims**



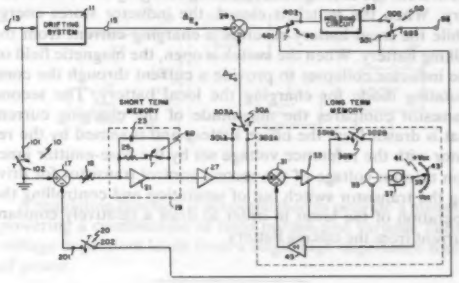
Disclosed is a controller principally for a flight craft and utilizing a single control element which can be manipulated for control of motion relative to pitch, roll, and yaw axes, these axes being mutually perpendicular to one another. The control element is mounted in a base member for pivotal movement about a longitudinal "yaw" axis extending through the control element and the degree of pivotal movement controls a yaw function. The base member is mounted for pivotal movement about a "roll" axis, which is perpendicular to the longitudinal "yaw" axis and the degree of pivotal movement controls a "roll" function. The control element has a handle pivotally mounted on it for pivotal movement about a "pitch" axis which is perpendicular to the longitudinal "yaw" axis and to the "roll" axis. The handle can be manipulated to provide pivotal movmeent about any one or more of the axes individually or contemporaneously. Spring biased centering mechanisms are provided for "zero" settings of the handle and control element. The mountings for pivotal movement include shafts along the respective axes which are part of a solid state transducer so that pivotal rotation about any of the axes directly couples rotation of a shaft to an electrical transducer for a direct read-out of the pivotal position. Each transducer includes three Hall Effect generators equiangularly spaced about an axis and a six pole magnetic plate coupled to the rotational shaft for producing the direct electrical read out. The use of multiple generators provides triple redundancy as a safety factor.

3,771,038
DRIFT CORRECTING SERVO

Casimir Joseph Rubis, Jamestown Road, Davidsonville, Md.

Filed Nov. 27, 1970, Ser. No. 93,311
Int. Cl. G05b *21/02*
U.S. Cl. 318—636 **5 Claims**

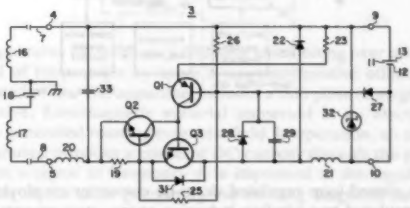
This invention is an error correcting circuit to cancel the drift of a drifting electronic or electromechanical system by periodically sampling the output of the drifting electronic or electromechanical system for output signal error due to drift and then introducing a feedback signal to cancel out the drift error thereby providing a corrected output. The invention encompasses a short and a long term memory and functions by periodically setting the drifting electronic or electromechanical system input to zero for a short time sampling interval, sensing the output of the drifting system, developing a feedback correction signal and then adding or subtracting the feedback signal from the drifting system output to effectively cancel out the error portion of the drifting system output signal. The short term memory provides an almost instantaneous feedback correction signal value and very quickly brings the drifting system output to its corrected signal amplitude while simultaneously initiating a change in the output of the long term memory to bring the output of the long term memory into coincidence with the output of the short term memory. The short term memory holds the correction signal after the expiration of the short sampling period, long enough for the long term memory signal output to become equal to the short term memory correction signal. Then the short term memory is taken out of circuit and the stable long term memory signal is introduced to provide the corrected signal for the electronic system over a relatively long time interval, until the next sampling period. Additionally, during the sampling period when the drifting system input is set to zero, a holding circuit having the signal value of the drifting system immediately before the sampling period, is introduced in place of the drifting system and during the sampling period provides an output signal in place of the drifting system.



3,771,039
BATTERY CHARGING CIRCUIT FOR SUBSCRIBER CARRIER EQUIPMENT

James A. Stewart, Menlo Park, Calif., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Mar. 1, 1972, Ser. No. 230,620
Int. Cl. G05f *1/56*; H02j *7/06*
U.S. Cl. 320—2 **8 Claims**



This charging circuit is a two-port network with an input port connected through a cable pair to a central office talking battery, and an output port connected across a local sub-

scriber battery. The charging circuit comprises a current sensing resistor, a switching transistor, and an inductor connected in series with the talking battery and the local battery through the lines of the cable pair; a commutating diode connected across the series combination of the inductor and the local battery; a first control transistor for driving the switching transistor and having its base electrode regeneratively coupled to the collector electrode of the switch through the parallel combination of a diode and a capacitor; and, a second control transistor having its base-emitter junction connected across the resistor and having its collector electrode connected to the base electrode of the switch. The transistor switch alternately connects the inductor and the local battery to and disconnects them from the talking battery during charging of the local battery. When the switch is closed, the inductor stores energy while the local battery receives a charging current from the talking battery. When the switch is open, the magnetic field on the inductor collapses to provide a current through the commutating diode for charging the local battery. The second transistor compares the magnitude of the charging current that is drawn from the office battery and is sensed by the resistor with the reference voltage set by the base-emitter junction turn-on voltage of the second control transistor for driving the transistor switch out of saturation and controlling the operation of the latter in order to draw a relatively constant current from the talking battery.

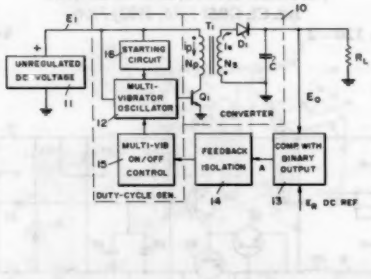
ERRATUM

For Class 320—39 see:
Patent No. 3,771,043

3,771,040
REGULATED DC-TO-DC CONVERTER FOR VOLTAGE STEP-UP OR STEP-DOWN WITH INPUT-OUTPUT ISOLATION

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of; Sam Yun-Ming Feng, and Thomas G. Wilson, both of Durham, N.C.

Filed Apr. 18, 1972, Ser. No. 245,063
Int. Cl. H02m *3/32*
U.S. Cl. 321—2 **6 Claims**

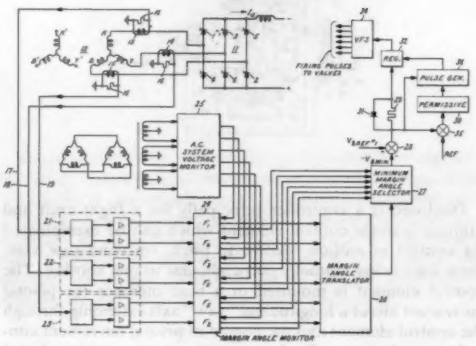


A closed-loop regulated dc-to-dc converter employing an unregulated two-winding inductive-energy storage converter is provided by using a magnetically coupled multivibrator acting as a duty-cycle generator to drive the converter. The multivibrator is comprised of two transistor switches and a saturable transformer. The output of the converter is compared with a reference in a comparator which transmits a binary zero until the output exceeds the reference. When the output exceeds the reference, the binary output of the comparator drives transistor switches, via a dc isolation circuit, which control the multivibrator to turn the multivibrator off. The multivibrator is unbalanced so that a predetermined transistor will always turn on first when the binary feedback signal becomes zero.

3,771,041
MARGIN ANGLE CONTROL FOR HVDC CONVERTER HAVING IMPROVED VALVE CURRENT MONITOR

Philip Chadwick, Winnipeg, Manitoba, Canada, assignor to General Electric Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 111,035, Jan. 29, 1971, abandoned. This application Feb. 25, 1972, Ser. No. 229,359
Int. Cl. H02m *7/52*
U.S. Cl. 321—5 **32 Claims**



A margin angle control for a power converter including a valve current monitor for deriving output electric signals representative of the current conducting interval of the thyristor devices comprising the power converter. An alternating current voltage monitor derives output electric signals representative of the voltages appearing across the respective thyristor devices so that by comparing the cessation of current flow through the respective thyristor devices to the point where the voltage across the device passes through zero potential during reversal of the polarity in the voltage across the respective thyristor device, a measure of the margin angle of the device is obtained. Margin angle signal developing circuits are described responsive to the valve current monitor and the voltage monitor for deriving output margin angle signals representative of the margin angles of the respective thyristor devices in the power converter. A selector circuit is responsive to the margin angle signal developing circuit and selects out that margin angle signal representative of the smallest margin angle. The smallest margin angle signal is then compared in a summing circuit to a first reference margin angle signal to develop an error margin angle control signal for normally controlling operation of the thyristor devices. A comparison circuit is coupled to the summing circuit and is responsive to the error margin angle control signal derived in the summing circuit and to a second reference margin angle signal for detecting severe reductions in the smallest margin angle control signal and deriving a second output control signal that is applied in addition to the first error margin angle control signal for providing fast responding control the operation of the converter. In a preferred embodiment a gain change circuit is included in the normal control regulation loop and is responsive to the error margin angle control signal for reducing the gain of the loop in response to a condition where the detected minimum margin angle is less than the

reference minimum margin angle established by the first reference minimum margin angle signal whereby any tendency for the regulating system to overshoot and oscillate about a zero error condition, is minimized. The margin angle control is for use with a three-phase bridge connected converter employing at least six thyristor devices with three sets of two thyristor devices connected as a valve pair for each phase of a three phase supply transformer winding. The valve current monitor comprises a conventional alternating current transformer inductively coupled to each valve pair and includes valve current signal shaping and separating circuits for shaping and separating the signal representative of the conduction intervals of the respective thyristor devices in each valve pair. A delay is introduced with respect to the valve current signals to cause these signals to extend over and include or drown out any spurious overshoot signal pulses induced in the current transformer winding as a result of thyristor turn-off, etc. Compensation of the extended time duration of the valve current signal pulse is then provided for at a later point in the margin angle control.

3,771,042

PULSE TRANSFORMER FOR CONTROLLED RECTIFIER

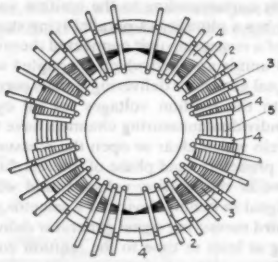
Werner Faust, Wettingen; Conrad Beriger, Aarau, and Hans Jurg Bossi, Nussbaumen, all of Switzerland, assignors to Aktiengesellschaft Brown, Boveri & Cie, Baden Switzerland

Filed July 13, 1971, Ser. No. 162,087

Claims priority, application Switzerland, July 20, 1970, 10982/70

Int. Cl. H02m *1/18*

U.S. Cl. 321—11 **9 Claims**



A transformer structure for producing pulses for igniting a chain of controlled rectifier units such as thyristors includes a primary winding consisting of one or more turns on which a number of toroidally configured iron cores are threaded. Each core is provided with at least two groups of secondary windings in which voltages are induced as a result of the alternating current which passes through the primary winding, and these voltages are applied to the control electrodes of the thyristors for igniting them. A system of screens is used to screen the secondary windings from the core. A screen first located adjacent the secondary windings has a width which is variable over the circumference of the core and does not completely screen the seondary windings from the core whereas 1a second screen located adjacent the core, i.e., between the core and the first screen completely surrounds the core and is of constant width. The first screen is electrically connectd to one end of one group of secondary windings remote from the junction of two adjacent groups of secondary windings, and to which junction the second screen is connected.

3,771,043

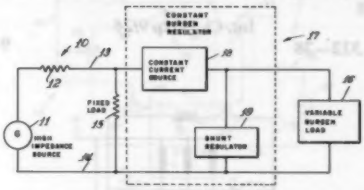
SYSTEM FOR POWERING A COMBINATION OF VARIABLE BURDEN AND FIXED BURDEN VOLTAGE DEPENDENT LOADS FROM A HIGH IMPEDANCE SOURCE

John A. Zulaski, Mount Prospect, Ill., assignor to S & C Electric Co., Chicago, Ill.

Filed Dec. 20, 1971, Ser. No. 209,851

Int. Cl. H02p *7/06*

U.S. Cl. 320—39 **5 Claims**



A regulating function is accomplished to provide a means of powering a combination of fixed burden and variable burden voltage dependent loads from a single high impedance source of power.

3,771,044

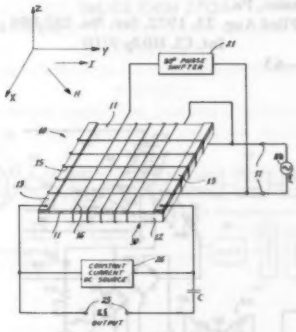
BROAD BAND FREQUENCY DOUBLER AND LIMITER UTILIZING MAGNETO-RESISTIVE EFFECT IN A ROTATING MAGNETIC FIELD

Leonard D. Cohen, Brooklyn, N.Y.; Brian A. Shortt, and Michael J. Urban, both of Framingham, Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Feb. 21, 1973, Ser. No. 334,347

Int. Cl. H02m *5/00*

U.S. Cl. 321—69 NL **9 Claims**



Apparatus for frequency doubling and limiting over a broad band of frequencies by using a magneto-resistive effect in a magnetic film. The apparatus includes a thin plate of magneto-resistive, ferromagnetic material immersed in an electronically generated rotating magnetic field. In operation, an external source provides a constant DC current through the plate. When a signal at frequency f_1 is impressed at the input terminals of the coils generating the rotating magnetic field, a signal at frequency $2f_1$ appears at the output terminals of the magneto-resistive element. As the frequency of the input drive signal is changed, the output signal will continuously follow the input signal but at double the frequency without the use of an output filter. The amplitude of the output signal is directly proportional to the magnitude of the impressed DC current and to the magnitude of the spatial magneto-resistance effect in the plate. At sufficiently large input levels, the amplitude of

the output signal will remain constant with input signal level. The device is capable of functioning as a frequency doubler and limiter on a frequency range from sub-audio to VHF.

3,771,045

D-C POWER SUPPLY SYSTEM FED FROM AN A-C GENERATOR

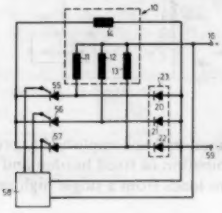
Peter Storz, Sindelfingen, Germany, assignor to Robert Bosch GmbH, Gerlingen-Schillerhohe, Germany

Filed Aug. 8, 1972, Ser. No. 278,727

Claims priority, application Germany, Sept. 28, 1971, P 21 48 242.8

Int. Cl. H02p *9/26*

U.S. Cl. 322—28 **9 Claims**



To provide regulated output from a polyphase generator having a field winding in shunt circuit, output rectifiers from the polyphase generator are connected to be half-wave rectifiers and exciter rectifiers for the field winding are connected in a full-wave rectification circuit, so that higher excitation voltage is available even upon full loading of the generator.

3,771,046

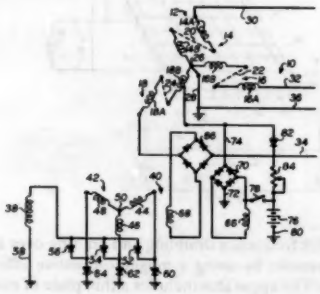
GENERATOR WITH BRUSHLESS EXCITER FIELD

Earl F. Harter, Lancaster, Pa., assignor to Fidelity Electric Co., Inc., Lancaster, Pa.

Filed Aug. 23, 1972, Ser. No. 282,896

Int. Cl. H02p *9/10*

U.S. Cl. 322—63 **11 Claims**



The generator includes a plurality of stator windings which are connected in a preselected sequence and a plurality of leads are adapted to connect the plurality of stator windings with a load to energize the load. A generator field winding is mounted on a rotating shaft and is in electromagnetic cooperation with the plurality of stator windings for inducing a potential therein. An exciter provides the potential for energizing the generator field winding. The exciter includes an exciter armature mounted on the shaft and connected to the field winding and two separate exciter field windings are in electromagnetic cooperation with the exciter armature for inducing a potential therein. The first exciter field winding is controlled by a first source of energy and controls the no-load voltage of the generator. The second exciter field winding is responsive to the load current flowing through one phase of the generator for inducing a potential in the exciter armature which is proportion to the load current, thereby exciting the generator field winding in accordance with the load current drawn from the generator.

3,771,047

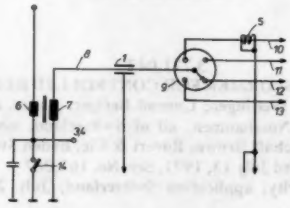
APPARATUS FOR AUTOMATIC DETECTION OF THE COURSE OR BEHAVIOR OF THE IGNITION VOLTAGES WITH RESPECT TO TIME IN A MULTI-CYLINDER COMBUSTION ENGINE

Erich Spengler, Wolfsburg, and Heiko Requardt, Gifhorn, both of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed July 23, 1971, Ser. No. 165,079

Int. Cl. G01m *15/00*

U.S. Cl. 324—16 R **11 Claims**



In an apparatus for automatically detecting the response behavior of the ignition voltage with respect to time in the various elements of the high voltage devices in a multi-cylinder engine, wherein a first measuring signal generator delivers signals corresponding to the ignition voltages for all cylinders and has a plurality of parallel-lying storage measuring channels of a measuring unit connected therewith to which also a control unit is assigned which is coupled with a second measuring signal generator delivering signals corresponding at least timely to the ignition voltages for all cylinders, and wherein the individual measuring channels have timing stages included therein which clear or open the measuring channels only during a predetermined phase of interest during the time response curve of the ignition voltages, and which includes also a clear signal switching device of a selector which is coupled with a third measuring signal generator delivering signals corresponding at least in time to the ignition voltages for all cylinders and also with a fourth measuring signal generator delivering signals corresponding at least in time to the ignition voltages for one of the cylinders which is first in the ignition sequence, further comprising a shift register and gate switching devices which switch the clear signal generator only upon the arrival of signals from the fourth measuring signal generator during an ignition cycle of the engine, whereby an accurate pick-up of the ignition voltages results with respect to time in the form of a response curve at various phases of the ignition process, which curves can be further evaluated in output devices of the register or printing type.

3,771,048

SEALED CONTACT SWITCH TESTING APPARATUS UTILIZING HELMHOLTZ COILS

Robert Harold Bond, and Robert Owen Bridges, both of Winston-Salem, N.C., assignors to Western Electric Company, Incorporated, New York, N.Y.

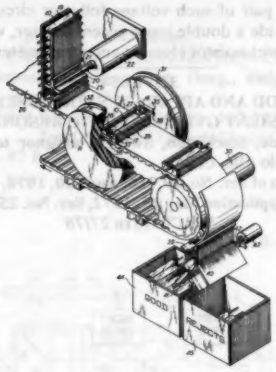
Filed Apr. 13, 1972, Ser. No. 243,777

Int. Cl. G01r *31/02, 33/00*

U.S. Cl. 324—28 RS **5 Claims**

An apparatus for testing sealed contact switches utilizes a pair of spaced coaxial coils with a conveyor mechanism

passing between the coils for holding and indexing the switches individually to a position along the axis of the coils. The coils have a mean radius which is equal to the distance between the mean planes of the coil. Facilities apply an increasing and then decreasing current through the coils to test the switches for operate and release points. Also facilities apply a fixed current to the coils for holding the switches closed to measure contact resistance.



3,771,049

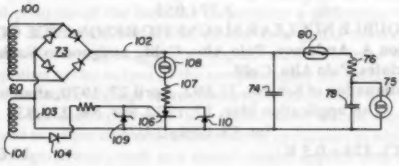
FAULT INDICATOR AND LOCATOR FOR BURIED CABLES AND ZERO SEQUENCE CURRENT SENSING DEVICE

Nicholas E. Piccione, Smithtown, N.Y., assignor to Dossert Manufacturing Corporation, Brooklyn, N.Y.

Continuation-in-part of Ser. No. 864,919, June 17, 1969, abandoned, which is a continuation-in-part of Ser. No. 669,101, Sept. 20, 1967, abandoned. This application Jan. 5, 1971, Ser. No. 104,102

Int. Cl. G01r *31/02, 31/08*

U.S. Cl. 324—51 **6 Claims**



An underground cable fault indicator and locater is provided to indicate the location of a fault or short circuit in the cable. The cable is passed through the apertures of a plurality of spaced transformer sensors connected to indicating elements located in below grade vaults or above the ground. Upon the occurrence of a fault in the cable, the indicating elements provide a visual indication of the section of the cable in which the fault has occurred.

3,771,050

REACTANCE MEASUREMENT APPARATUS

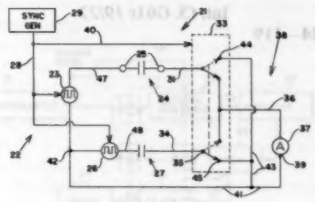
Yehuda Golahny, 24 Dorr Rd., Newton, Mass., and David A. Gwinn, 66 Page Rd., Bedford, Mass.

Filed Jan. 3, 1972, Ser. No. 215,004

Int. Cl. G01r *27/00*

U.S. Cl. 324—57 R **19 Claims**

Disclosed is an apparatus for measuring the energy storage characteristics of passive electrical components such as capacitors and inductors. In a capacitative embodiment an a.c. signal alternately charges and discharges a capacitor under test and a second a.c. signal similarly charges and discharges a standard reference capacitor. An indicator that displays current flow is alternately connected to the capacitors by a switch that is synchronized to the a.c. signals. The relative amplitudes of the a.c. signals are adjusted so that each capacitor absorbs an equal charge and the indicator is responsive to this condition and displays a null indication. A capacitance change in either capacitor causes a departure from the null condition. A preferred embodiment is disclosed in which the capacitor under test is a variable capacitance transducer. Inductance measurements are made with a similar inductance circuit.



3,771,051

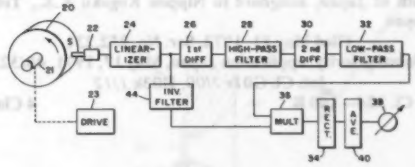
APPARATUS AND METHOD FOR INDICATING SURFACE ROUGHNESS

Robert C. Abbe, Newton, Mass., assignor to ADE Corporation, Watertown, Mass.

Filed June 14, 1972, Ser. No. 262,520

Int. Cl. G01r *27/26*

U.S. Cl. 324—61 R **38 Claims**



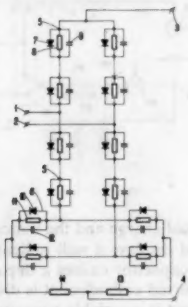
A non- contacting capacitive probe positioned adjacent a moving surface whose roughness is to be indicated provides a signal which corresponds to the distances between the sensing end of the probe and those points comprising the successive adjacent portions of the surface. This signal is twice differentiated to provide an indication of surface roughness. Preferably, the signal is also filtered to attenuate noise and those components of the signal arising from variations in the distance between the probe and the surface caused by non-uniform movement of the surface. Additionally, the transducer's signal is modified to obtain an output which is independent of the distance between the probe and surface; this is achieved by multiplying the twice differentiated signal by scaler values corresponding to the inverse of the distance between the probe and surface.

3,771,052

METHOD OF MEASURING A RECTIFIED VOLTAGE AND A RECTIFICATION CIRCUIT THEREFOR

Władysław Paszek, ul. Mała; Piotr Drysz, ul. Grazyny 11/21; Edward Nycz, ul. Wieczorka 4/28, all of Bielsko-Biata, and Walenty Wycisk, Kolonia Urzozowa 3, Goezatkowie Zdroz, all of Poland

Filed May 24, 1971, Ser. No. 146,325
Claims priority, application Poland, May 25, 1970, P-140 865
Int. Cl. G01r 19/22
U.S. Cl. 324—119 2 Claims



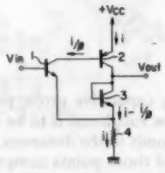
A method of measuring a rectified voltage by means of a rectification circuit. This method is particularly suitable to high-voltage systems, in which the rectifier includes great numbers of series-connected rectifying elements. The measuring method consists of separating from a load current its components namely the forward current and the reverse current which are flowing through a rectifier. The separation of the forward current and the reverse current is obtained by means of an additional low-power rectifying set provided with a resistor across which is produced a signal proportional to the rectified d-c output voltage.

3,771,053

POTENTIOMETER USING A VOLTAGE FOLLOWER CIRCUIT

Yoshihiro Kaizawa, Kawasaki, and Sakuji Watanabe, Urawa, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed May 11, 1972, Ser. No. 252,231
Claims priority, application Japan, May 17, 1971, 46/32391
Int. Cl. G01r 7/00; H03k 1/12
U.S. Cl. 324—140 R 4 Claims



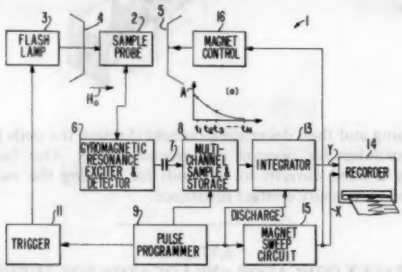
A voltage follower circuit comprises a voltage source, an npn transistor, a pnp transistor, a rectifier element such as npn transistor, and a resistor element. The base of the first-named npn transistor acts as the input terminal of the voltage follower circuit. The base and emitter of the pnp transistor are connected with the collector of the first-named npn transistor and the positive terminal of the voltage source, respectively. The cathode and anode of the rectifier element are connected with the emitter of the first-named npn transistor and the collector of the pnp transistor, respectively, and the point of connection between the anode and the collector of the pnp transistor acts as the output terminal of the voltage follower circuit. One end of the resistor element is connected with the point of connection between the cathode and the emitter of the first-named npn transistor, and the other end of the resistor element is grounded. A pair of such voltage follower circuits are combined to provide a double input potentiometer, which further includes a preset resistor element and an ammeter.

3,771,054

METHOD AND APPARATUS FOR OBSERVING TRANSIENT GYROMAGNETIC RESONANCE

James S. Hyde, Stockholm, Sweden, assignor to Varian Associates, Palo Alto, Calif.

Continuation of Ser. No. 29,916, April 20, 1970, abandoned.
This application May 15, 1972, Ser. No. 253,667
Int. Cl. G01n 27/78
U.S. Cl. 324—0.5 R 22 Claims



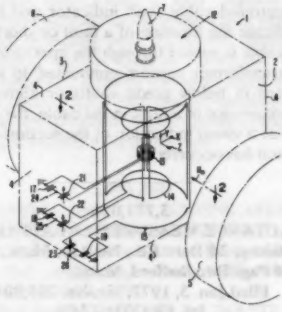
Gyromagnetic resonance spectrometers and methods of operating same are disclosed wherein gyromagnetic resonance of a sample of matter is excited and detected at a first electron resonance condition repetitively and abruptly purturbating said sample of matter to produce a train of transient resonance responses after said purturbation is removed. Establishing a second electron resonance condition within the sample. The transient response is detected as a function of the relatively slow changes in the electron resonance condition to obtain an output transient resonance spectrum.

3,771,055

DOUBLE NUCLEAR MAGNETIC RESONANCE COIL

Weston A. Anderson, Palo Alto, Calif., assignor to Varian Associates, Palo Alto, Calif.

Continuation of Ser. No. 31,892, April 27, 1970, abandoned.
This application Mar. 17, 1972, Ser. No. 235,832
Int. Cl. G01n 27/78
U.S. Cl. 324—0.5 R 11 Claims



Double nuclear magnetic resonance coil structure and a spectrometer using same are disclosed. The coil structure comprises three radio frequency coils disposed with their

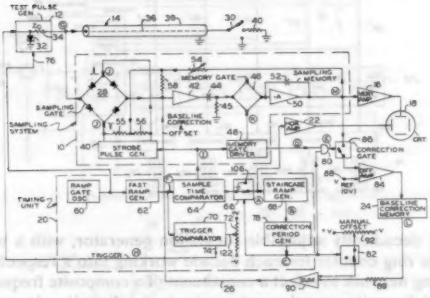
respective magnetic axis in substantially orthoganal relation to each of the other two coils, whereby the coils are magnetically decoupled from each other while being radio frequency magnetic coupled to a nuclear sample disposed within the surrounding coils.

3,771,056

DISPLAY BASELINE STABILIZATION CIRCUIT

Henry A. Zimmerman, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed July 30, 1971, Ser. No. 167,711
Int. Cl. G01r *27/00, 1/02*
U.S. Cl. 324—57 R **12 Claims**



A display baseline stabilization circuit is described which automatically compensates for differences in the quiescent D.C. voltage levels of input signals being displayed on a cathode ray tube or other display device, to maintain the baseline displays of such levels in the same vertical position. The stabilization circuit includes a sampling system for sampling the quiescent voltage level of such input signals and comparator means for comparing the sample output voltage with a D.C. reference voltage corresponding to the desired vertical position of the baseline to produce a difference voltage. The difference voltage is stored in a gated correction memory whose output is a baseline correction voltage feedback applied to the output of the sampling gate for subtraction of the correction voltage from the sample output signal transmitted to the display device. The stabilization circuit may be employed in a time domain reflectometer apparatus in which a test pulse generator, such as a tunnel diode, applies step voltage input pulses to one end of a transmission line under test to measure the value and location of any discontinuation in the characteristic impedance of such line. The other end of such transmission line is selectively terminated in an open circuit, a short circuit, or a finite resistance so that the quiescent D.C. voltage level of the step voltage input signal varies with such termination changes and tends to cause the display baseline on the cathode ray tube to move vertically. However, this movement of the baseline is prevented by the stabilization circuit.

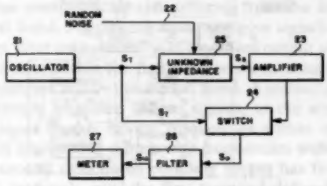
3,771,057

METHOD AND APPARATUS FOR MEASURING IMPEDANCE IN THE PRESENCE OF UNWANTED SIGNALS

Jacek Antoni Persidok, Chicago, Ill., assignor to Ecos Electronics Corporation, Chicago, Ill.

Filed July 10, 1972, Ser. No. 270,148
Int. Cl. G01r *27/00*
U.S. Cl. 324—57 R **10 Claims**

Method and apparatus for measuring an unknown impedance in the presence of extraneous signals by injecting into the impedance to be measured an oscillating current signal, which may be modulated, generating in the unknown impedance an oscillating voltage signal, applying the generated signal and any extraneous signals present in the circuit under test to a switch which is keyed by the injected current pulse so as to conduct only during the times the injected pulse has a



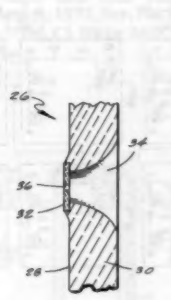
given polarity, thereby producing through the switch a signal of a pulsating nature, and filtering the pulsating signal to produce a DC voltage, the magnitude of which is a measure of the unknown impedance.

3,771,058

SCANNER ELEMENT FOR COULTER PARTICLE APPARATUS

Walter R. Hogg, Miami Lakes, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Filed Apr. 5, 1971, Ser. No. 131,361
Int. Cl. G01n *27/00*
U.S. Cl. 324—71 CP **17 Claims**

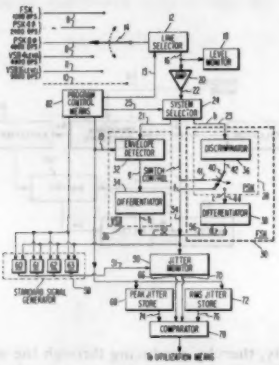


The scanner element or aperture tube of a Coulter particle apparatus has a wafer in which the aperture is formed, the wafer being made of a material which has electrical insulating properties but high heat conductivity. The tube is of glass and the wafer is set into the side wall of the tube. The result is a scanner element of increased sensitivity. In one form of the invention, the surfaces of the tube, at least in the vicinity of the wafer, are covered by a coating of highly conductive material coming close to but not engaging within the aperture of the wafer. The coating inside and outside of the tube will comprise electrodes in the bodies of liquid respectively disposed on opposite sides of the tube wall.

3,771,059
UNIVERSAL DATA QUALITY MONITOR

Jaquith Gould Butler, and Alfred Mack, both of Cherry Hill, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 27, 1972, Ser. No. 238,165
Int. Cl. H04b 1/00
U.S. Cl. 325—31 14 Claims

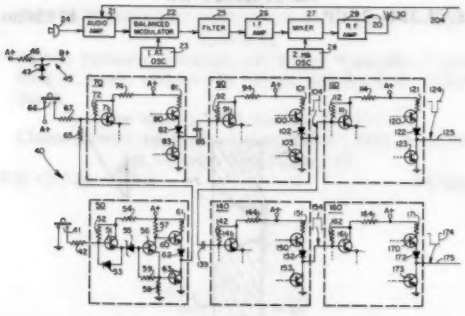


A universal data quality monitor selectively samples any of a plurality of differently modulated signals, each of which may have any of a plurality of different data rates, for monitoring the amount of jitter in the sampled signal.

3,771,060
TONE OPERATED SINGLE SIDE BAND COMMUNICATION SYSTEM

Keith H. Wycoff, P.O. Box 308, Lexington, Nebr.

Filed July 26, 1971, Ser. No. 165,475
Int. Cl. H04b 1/68
U.S. Cl. 325—50 10 Claims

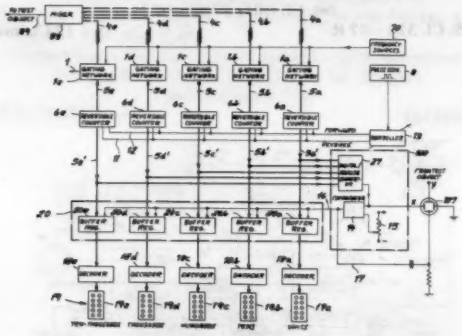


The system has a transmitter which transmits at least one pair of simultaneous tones that last for a predetermined duration followed by a voice message. The receiver in the system has a process circuit to detect the tones and the voice message, which voice message is applied to an audio circuit for conversion into sound waves. The tones are mixed to provide sum and difference frequency signals. Preferably, a low-pass filter is provided to pass only the difference frequency signal to a narrow band-pass, highly-selective tuned circuit. If the frequency of the difference frequency signal matches that of the tuned circuit, there will be provided a signal of increased amplitude for actuating an electronic switch. In the presence of that signal, the electronic switch will render the audio circuit operative to reproduce the voice message.

3,771,061
DECADICALLY ADJUSTABLE OSCILLATION GENERATOR WITH FREQUENCY MARKER

Herbert Bayer, Reutlingen, Germany, assignor to Wandel U. Gottermann, Reutlingen, Germany

Filed Feb. 14, 1972, Ser. No. 225,743
Claims priority, application Germany, Feb. 13, 1971, P 21 06 977.2
Int. Cl. H04b 1/00
U.S. Cl. 325—67 5 Claims

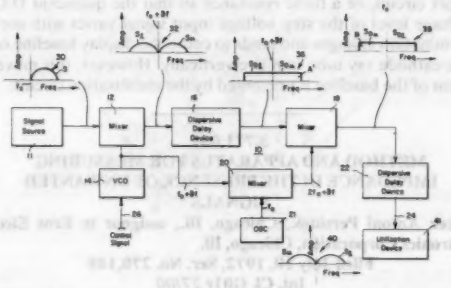


A decadically adjustable oscillation generator, with a ten-stage ring counter for each decade working into a respective gating network to select a constituent of a composite frequency, delivers its several counter outputs to a digital/analog converter for producing a horizontal sweep voltage of an oscilloscope indicating the variations in amplitude or phase of an output voltage from a test object energized with that frequency. As the counters are periodically stepped forward and backward to modulate their composite output frequency between selected limits, the sweep voltage is matched with a manually selected reference voltage in a comparator generating a trigger pulse upon equality of the two voltages. The current readings of the several counters, continuously transmitted to respective stages of a buffer register in parallel with the digital/analog converter, are transferred to a visual indicator by the trigger pulse which also causes the display of a frequency marker on the oscilloscope screen.

3,771,062
ELECTRONICALLY CONTROLLABLE TIME DELAY CIRCUITS

Joseph Burnsweig, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 2, 1972, Ser. No. 231,192
Int. Cl. H03k 5/159
U.S. Cl. 328—55 19 Claims



Time delay devices disclosed herein include first and second dispersive delay lines intercoupled to provide "flat" time

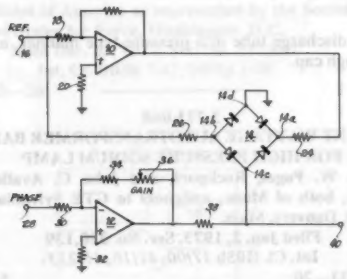
delay of signals processed therethrough; with the value of the time delay being selectable by means for controlling the carrier frequency of the signals. In one disclosed embodiment a time delay controller circuit, incorporating an electronically variable time delay device mechanized in a feedback control loop arrangement, provides a reduction in time jitter between successive signal groups; and another embodiment utilizes a variable time delay device in a precision large deviation, wide bandwidth phase modulator configuration.

3,771,063

BI-POLAR PHASE DETECTOR

Ronald E. Barrett, Colorado Springs, Colo., assignor to Calnor of El Paso, Inc., El Paso, Tex.

Filed Mar. 13, 1972, Ser. No. 234,181
Int. Cl. H03b *3/04*
U.S. Cl. 328—134 **10 Claims**



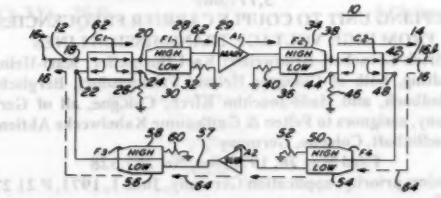
A phase detector employs a pair of operational amplifiers for establishing equal amplitudes for a reference signal and the signal of which the phase is to be measured. The reference signal alternately blocks an unblocks a diode bridge to provide a linear bi-polar output signal proportional to the difference in phase between the two input signals.

3,771,064

BIDIRECTIONAL SIGNAL PROCESSING MEANS

Eugene J. Hebert, Jr., Elkins Park, Pa., assignor to American Electronic Laboratories, Inc., Colmar, Pa.

Filed July 3, 1972, Ser. No. 268,878
Int. Cl. H01p *5/14*; **H03h** *7/04, 7/46*
U.S. Cl. 333—1 **15 Claims**



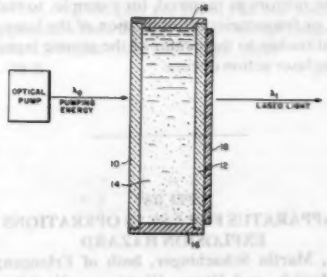
A bidirectional signal processing means comprising a first directional coupling means having first, second, and third terminals, input signals received at the first terminal being delivered to the second and third terminals, while signals received at the second terminal are delivered to the first terminal of the coupling means with the delivery of such signals to its third terminal being minimized. Input signals received at the third terminal of the first directional coupling means are delivered to its first terminal and the amplitude of such signals delivered to its second terminal is minimized. A first filter unit receives signals from the second terminal of the first coupling means and delivers signals at its output which have frequencies within a first band of frequencies, and a second filter unit receives and delivers signals to the third terminal of the first coupling means which have frequencies in a second band of frequencies contingent to and differing from the frequencies of the first band. Amplifying means receive signals delivered by the first filter unit and delivers amplified output signals having frequencies within the first band while attenuating signals with frequencies within the second band. A second amplifying means delivers amplified output signals, to the second filter unit for input signals having frequencies within the second band while attenuating signals with frequencies within the first band. A second directional coupling means has first, second and third terminals with the first terminal delivering signals which it receives to the second and third terminals, while the input signals received at its second terminal are delivered to its first terminal and the amplitude of such signals delivered to its third terminal is minimized. Input signals received at its third terminal are delivered to its first terminal while the amplitude of such signals delivered to its second terminal is minimized. A third filter unit receives signals from the first amplifying means and delivers signals to the second terminal of the second coupling means which have frequencies within the first band of frequencies, while a fourth filter unit receives signals from the third terminal of the second coupling means and delivers signals to the second amplifying means which have frequencies within the second band of frequencies.

3,771,065

TUNABLE INTERNAL-FEEDBACK LIQUID CRYSTAL-DYE LASER

Lawrence S. Goldberg, Alexandria, and Joel M. Schnur, Springfield, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 9, 1972, Ser. No. 279,162
Int. Cl. H01q *3/00*
U.S. Cl. 331—94.5 L **6 Claims**



A liquid lasing medium having internal distributed feedback by virtue of the molecular structure of a cholesteric liquid crystal material, said medium comprising a mixture of a strongly fluorescent dye, 7-diethyl-4-methyl coumarin, and a cholesteric liquid crystal solution of 40 percent cholesteryl oleyl carbonate, 30 percent cholesteryl chloride and 30 percent cholesteryl monanoate.

3,771,066

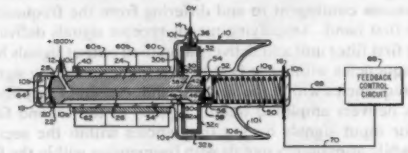
GAS LASER

Glenn M. Burgwald, Mountain View; William P. Kruger, and Donald L. Hammond, both of Los Altos Hills, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 24, 1970, Ser. No. 13,285

Int. Cl. H01s *3/00*

U.S. Cl. 331—94.5 D **17 Claims**



A rod made of an insulating material having a thermal coefficient of expansion in the range from +1 to −1 part in 10^7 per degree centigrade is mounted between a pair of mirrors and hermetically sealed either within a glass or a stainless steel enclosure containing a gas discharge medium. The stainless steel enclosure may be clamped to and fixedly spaced from the rod by projections formed on the enclosure and symmetrically disposed around the rod toward the ends of the rod. The mirrors and an annular piezoelectric disc positioned within the enclosure between one of the mirrors and one end of the rod are axially mechanically biased against the ends of the rod either by a spring loading structure or by a gas pressure differential. An anode and an annular cathode electrically insulated from one another for operation at different potentials are mounted toward the opposite ends of the rod. A discharge path communicating with the gas discharge medium and including a portion of a bore axially extending through the rod is provided in the rod between and in communication with the anode and the cathode to provide a gas discharge for excitation of the gas discharge medium to produce a laser beam. This discharge path may be placed in a magnetic field having a component in the direction of the laser beam to Zeeman split the atomic transition line at which the laser action occurs so that the laser oscillates at two different frequencies and thereby produces an output beam with two components of different frequency and polarization. In response to a portion of the laser beam a feedback control circuit changes the thickness of the piezoelectric disc to maintain the spacing between the mirrors as required, for example, to stabilize the frequency, or frequencies, of oscillation of the laser at or in a known relationship to the center of the atomic transition line at which the laser action occurs.

3,771,067

LASER APPARATUS FOR USE IN OPERATIONS WITH EXPLOSION HAZARD

Arno Kohl, Martin Schachinger, both of Erlangen; Helmut Kindl, Munich, and Otmar Hintringer, Neubiberg, all of Germany, assignor to Siemens Aktiengesellschaft, Berlin, Munich, Germany

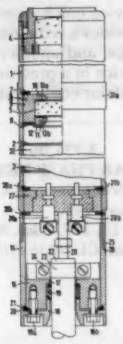
Filed Mar. 24, 1972, Ser. No. 237,632

Claims priority, application Germany, Mar. 25, 1971, P 21 14 449.0

Int. Cl. H01s *3/02*

U.S. Cl. 331—94.5 D **4 Claims**

The cylindrical metal housing of a gas laser serves as an explosion protection housing. The explosion protection is achieved by bodies inserted into the housing in front of and behind a discharge tube in a pressure-type manner, and by a feedthrough cap.



3,771,068

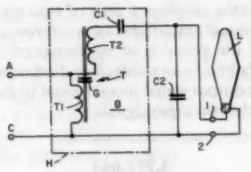
CONSTANT WATTAGE AUTOTRANSFORMER BALLAST FOR HIGH PRESSURE SODIUM LAMP

Frederick W. Paget, Rockport, and John C. Avallon, Jr., Beverly, both of Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed Jan. 2, 1973, Ser. No. 320,139

Int. Cl. H05b *37/00, 41/16, 41/233*

U.S. Cl. 333—20 **5 Claims**



A ballast for a high pressure sodium lamp includes a constant wattage autotransformer with a series capacitor, of 10 microfarads for example, between the autotransformer secondary and one lamp terminal, and an arc sustaining capacitor of lower value connected in parallel with the secondary.

3,771,069

COUPLING UNIT TO COUPLE CARRIER FREQUENCIES FROM HIGH VOLTAGE TRANSMISSION LINES

Friedrich Levacher, Brauweiler; Karl Dornseifer; Karl-Heinz Nolting, both of Cologne; Helmut Frielingsdorf, Bergisch-Gladbach, and Hans-Joachim Kirch, Cologne, all of Germany, assignors to Felten & Guilleaume Kabelwerke Aktiengesellschaft, Cologne, Germany

Filed May 26, 1972, Ser. No. 257,328

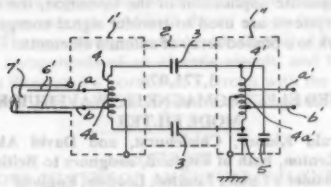
Claims priority, application Germany, June 1, 1971, P 21 27 193.2

Int. Cl. H03h *7/00*

U.S. Cl. 333—24 C **14 Claims**

An elongated, oil-filled isolating body has two metal caps. Each metal cap encloses one end of the elongated oil-filled body. An auto-transformer is enclosed inside each metal cap, the terminals of each of the auto-transformers connected across all the turns are connected to coupling capacitors located inside the oil-filled body. The terminals of one auto-

transformer connected across part of the turns is connectable to the high frequency leads of the transmission line, which also



carries high voltage phase cables, while the terminals of the other auto-transformer connected across part of the turns is connectable to a user device.

3,771,070

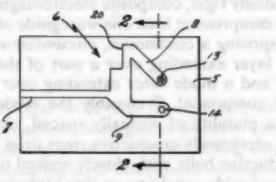
STRIPLINE-TO-TWO-CONDUCTOR BALUN

Joseph G. Gaudio, Port Jefferson Station, N.Y., assignor to The United States of America as represented by the Secretary of the United States Air Force, Washington, D.C.

Filed Dec. 22, 1972, Ser. No. 317,867

Int. Cl. H03h *7/42*; **H01p** *3/08*

U.S. Cl. 333—26 **1 Claim**



A stripline-to-two conductor balun having a bifurcated stripline input that is disposed between and insulated from two parallel ground plane members. One output conductor is connected directly to a first bifurcated stripline leg and passes through and is insulated from one ground plane member. The other output conductor passes through and is electrically connected to both ground plane members and the second bifurcated stripline leg. The second stripline leg is lengthened to provide phase compensation for the resulting RF short circuit.

3,771,071

ADJUSTABLE EQUALIZER FOR WIDE-BAND TRANSMISSION SYSTEM

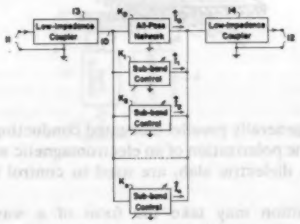
Egidio Alvazzi Delfrate, Milan, Italy, assignor to Societa Italiana Telecomunicazioni, Milan, Italy

Filed Apr. 17, 1972, Ser. No. 244,719

Claims priority, application Italy, Apr. 15, 1971, 23215 A/71

Int. Cl. H03h *7/14*; **H04b** *3/04*

U.S. Cl. 333—28 R **9 Claims**



An equalizer for a system transmitting a wide band of frequencies comprises a multiplicity of networks connected in parallel between a first coupler of low output impedance and a second coupler of low input impedance, one of these networks being of the all-pass type while the others are adjustably tuned to give passage to respective sub-bands centered on substantially equispaced frequencies between adjoining transmission channels. Each of the adjustable networks comprises a band-pass filter, including the primary winding of an internal transformer, and a polarity-inverting voltage divider.

3,771,072

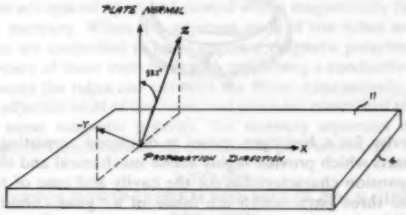
LOW VELOCITY ZERO TEMPERATURE COEFFICIENT ACOUSTIC SURFACE WAVE DELAY LINE HAVING GROUP AND PHASE VELOCITY VECTOR COINCIDENCE

Andrew J. Slobodnik, Jr., Burlington, Mass., assignor to The United States of America as represented by the Secretary of the United States Air Force, Washington, D.C.

Filed Dec. 15, 1972, Ser. No. 315,739

Int. Cl. H03h *7/30, 9/00, 9/30*

U.S. Cl. 333—30 R **1 Claim**



An acoustic surface wave delay line having a single crystal tellurium dioxide substrate member the acoustic surface wave propagation surface of which substantially coincides with a plane defined by the Euler angles Lambda = 0°, Mu = 58.2°, and Theta = 0°.

3,771,073

ULTRASONIC DEVICES USING GERMANIUM-CONTAINING CHALOGENIDE GLASSES

John Thorvald Krause, New Providence, and Charles Robert Kurkjian, Bernards Township, Somerset County, both of N.J., assignors to Bell Telephone Laboratories, Incorpoated, Murray Hill, N.J.

Division of Ser. No. 54,189, July 13, 1970, Pat. No. 3,655,255.

This application Dec. 20, 1971, Ser. No. 209,980

Int. Cl. H03h *7/30*; **C03c** *3/12, 3/00*

U.S. Cl. 333—30 R **6 Claims**

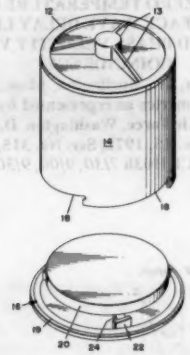
Ultrasonic devices are described which are dependent for their operation on certain germanium-containing compositions of the chalcogenide family of glasses. The ultrasonic devices exhibit acoustic losses comparable to those of devices made from fused silica.

3,771,074

TUNABLE CAVITY RESONATOR WITH RAMP SHAPED SUPPORTS

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of; Robert F.C. Vessot; Thomas E. Hoffman, both of Marblehead, Mass., and Martin W. Levine, Manchester, Mass.

Filed Mar. 20, 1972, Ser. No. 235,962
Int. Cl. H01p 1/00, 7/06
U.S. Cl. 333—83 R 8 Claims



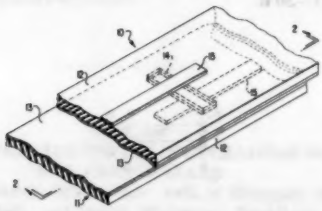
A cavity for a hydrogen maser is disclosed consisting of three parts which provide highly stable mechanical and thermal expansion characteristics for the cavity and ease of tuning. The three parts which are made of a "glass ceramic" material having a very small thermal expansion coefficient (α of $\pm 0.5\times10^{-7}$ in/in/°C over 0°–38°C) include 1) a top plate, 2) a cylinder with three interrupted helical ramps at its bottom and 3) a base which includes a bottom plate and three ramp lugs on which the helical ramps of the cylinder rest when the cylinder is placed on the base with the bottom plate in the cylinder. Cavity tuning is achieved by rotating the cylinder and thereby raising or lowering it on the base, which results in changing the cylinder volume by changing the distance between the bottom and top plates.

3,771,075

MICROSTRIP TO MICROSTRIP TRANSITION

Harry R. Phelan, Indialantic, Fla., assignor to Harris-Intertype Corporation, Cleveland, Ohio

Filed May 25, 1971, Ser. No. 146,736
Int. Cl. H01p 5/02, 3/08
U.S. Cl. 333—84 M 3 Claims



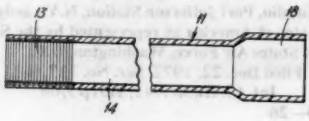
A coupling arrangement for microstrip systems, each system characterized by a dielectric with a ground plane contacting one side thereof and a conductive strip fastened to the other side. A small coupling hole in the ground plane immediately underlies the strip conductor at a current maximum for signal along the line. Two such microstrip systems are placed in back-to-back relation with their ground planes in physical contact and their coupling holes in registry to transfer signal being propagated in a transverse electromagnetic mode via one of the strip conductors to the other of the strip conductors and ultimately to a desired point or points of utilization. In a specific application of the invention, the coupled microstrip systems are used to transfer signal energy from a feed network to a phased array of antenna elements.

3,771,076

COMBINED ELECTROMAGNETIC WAVEGUIDE AND MODE FILTER

Henry Gerald Kidner, Chislehurst, and David Alexander Taylor, Kenton, both of England, assignors to British Insulated Callender's Cables Limited, London, England

Filed Feb. 1, 1972, Ser. No. 222,477
Claims priority, application Great Britain, Feb. 3, 1971, 3,811/71
Int. Cl. H01p 1/16, 3/12
U.S. Cl. 333—95 R 12 Claims



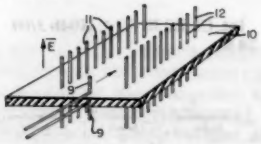
A substantially rigid, composite electromagnetic waveguide component comprises at least one waveguide of circular cross-section comprising a continuous, circumferential electrically cohductive layer extending over a part of the length of the component and a mode filter extending over the remaining part of the component. Preferably the mode filter is constituted by a plurality of mutually spaced, circumferentially continuous, electrically conductive rings or at least one electrically conductive helix with closely spaced turns, the mode filter and waveguide overlying an inner tubular layer of insulating material. A reinforcing insulating body preferably surrounds the component and renders it substantially rigid. In a preferred embodiment a mode filter is positioned at one end of the component and the other end is shaped to form a socket.

3,771,077

WAVEGUIDE AND CIRCUIT USING THE WAVEGUIDE TO INTERCONNECT THE PARTS

Frederick J. Tischer, 2300 M4-Avent Ferry Rd., Raleigh, N.C.

Filed Sept. 24, 1970, Ser. No. 75,086
Int. Cl. H01p 3/16; H01q 13/06; H01p 3/12
U.S. Cl. 333—95 S 11 Claims



Rows of generally parallel elongated conducting members, parallel to the polarization of an electromagnetic wave and intersecting a dielectric slab, are used to control the path of such wave.

The invention may take the form of a waveguide. A waveguide utilizes a slab of insulating material. Two parallel rows of metallic posts, with each post generally perpendicular to the slab, intersect the slab. The rows of posts are spaced apart a distance at least equal to $0.6\lambda_0$ where λ_0 is the free

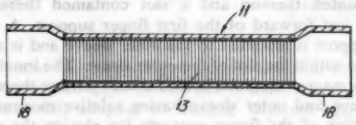
space wavelength for the lower end of the operational wavelength range of the circuit. The radio frequency energy transmitted down the waveguide is polarized electrically in a direction parallel to the axes of the posts.

The new waveguide, in one of its forms, is ideally suited to constitute an antenna, and is so shown as one form of the invention. The new waveguide is also ideally suited to interconnect the components of an electric circuit, and therefore I have also illustrated a portion of a circuit with the electronic components interconnected by the new waveguide.

3,771,078
MODE FILTER FOR AN ELECTROMAGNETIC WAVEGUIDE

Henry Gerald Kidner, Chislehurst, and David Alexander Taylor, Kenton, both of England, assignors to British Insulated Callender's Cables Limited, Lonon, England

Filed Feb. 1, 1972, Ser. No. 222,478
Claims priority, application Great Britain, Feb. 2, 1971, 3,706/71
Int. Cl. H01p *1/16, 3/12*
U.S. Cl. 333—95 R **5 Claims**

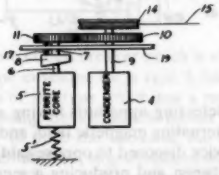


A substantially rigid mode filter of circular cross-section for use with electromagnetic waveguides includes an inner tubular layer of insulating material and, extending over the outer surface of the insulating layer throughout its length, a plurality of mutually spaced, circumferentially continuous rings or at least one helix with closely spaced turns of an electrically conductive coating. Preferably the mode filter is rendered substantially rigid by a reinforcing body of electrically insulating material, e.g., resin bonded glass fibre, which surrounds the ring or helix. Each end of the mode filter is preferably shaped to form a socket in which an end of a waveguide will fit.

3,771,079
TUNING DEVICE EFFECTING SIMULTANEOUS VARIATION OF INDUCTANCE AND CAPACITANCE

Kazuo Kawasaki, Ohmiya-shi, and Kazuo Arai, Saitsma-ken, both of Japan, assignors to Nissan Denshi Kabushiki Kaisha, Ohmiya-shi, Saitama-ken, Japan

Filed Feb. 25, 1972, Ser. No. 229,344
Claims priority, application Japan, Mar. 2, 1971, 46/10378
Int. Cl. H03j *3/22*
U.S. Cl. 334—70 **2 Claims**

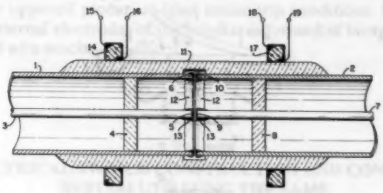


A tuning device for radio receivers including an inductor having a movable core and a variable condenser coupled one to the other for simultaneous operation to tune the receiver.

3,771,080
MAGNETICALLY RESPONSIVE FLUID SWITCH

Matthew Joseph Remec, North Riverside, Ill., assignor to Bell Telephone Laboratories, Incoporated, Murray Hill, N.J.

Filed Nov. 24, 1972, Ser. No. 309,243
Int. Cl. H01h *1/08*
U.S. Cl. 335—51 **6 Claims**

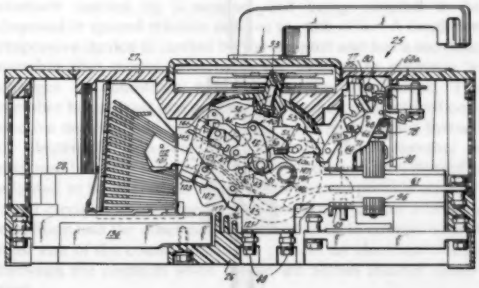


A switch comprises two electrically conducting magnetic tubes with their longitudinal axes in alignment wherein each tube has an electrically conducting magnetic wire coaxially located within it. The adjacent ends of both the wires and tubes are spaced apart and coated with a magnetically responsive mercury. When the adjacent ends of the tubes and the wires are controlled to be of opposite magnetic polarities, the mercury of these ends coalesces, producing a conductive path between the tubes and between the wires. Alternatively, when the adjacent ends of the tubes and wires are controlled to be of the same magnetic polarity, the mercury separates due to magnetic repulsion and the conductive path is broken.

3,771,081
INTERPOLE TRIP SYSTEM FOR MULTI-POLE CIRCUIT BREAKER

Albert Strobel, Cherry Hill, N.J., assignor to I-T-E Imperial Corporation, Spring House, Pa.

Filed July 27, 1972, Ser. No. 275,508
Int. Cl. H01h *73/00*
U.S. Cl. 335—9 **10 Claims**



A multipole circuit breaker having an individual spring powered overcenter toggle operating mechanism with a releasable cradle is provided with an interpole trip system in which there is a common tripper bar that does not support any of the latches for the operating mechanism cradles.

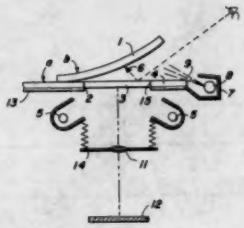
3,771,082
COPYING APPARATUS WITH AUXILIARY LIGHT SOURCE FOR ILLUMINATING AN ORIGINAL TO BE REPRODUCED

Seiji Matsumoto, Asaka-shi, Saitama-ken, Japan, assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 3, 1972, Ser. No. 214,634
Int. Cl. G03b *27/54*
U.S. Cl. 355—67 **7 Claims**

Apparatus is disclosed for use in aiding an operator to accurately position an original image to be reproduced in registra-

tion with the aperture and transparent platen in an image reproducing system. The disclosed apparatus includes an auxiliary light source which is disposed in a position outside the aperture and apart from the path of projection of the optical



system of the reproducing apparatus and illumination from the auxiliary light source is directed onto an area of the original to indicate the relative positioning between the original and the image reproducing system.

3,771,083

MAGNETICALLY OPERABLE MULTIPLE REED CONTACT

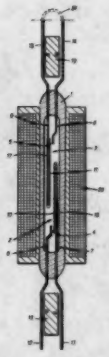
Gerhard Wessel, Kornwestheim, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Aug. 29, 1972, Ser. No. 284,526

Claims priority, application Germany, Sept. 6, 1971, P 21 44 538.5

Int. Cl. H01h *51/22, 51/28*

U.S. Cl. 335—153 **9 Claims**



In this multiple, magnetically-operable bistable reed arrangement, the reed tube contains two electrically separated, polarized contact sets each of which consists of two contact arms and an armature permanently connected to and magnetically separated from one of the contact arms. The respective associated contact arms are brought out as contact terminals at the same end of the reed tube and form, inside the reed tube, a magnetic operating air gap along with the free end of the armature, which projects into the space between the contact arms. Each of the armatures is suspended from one of the two associated contact arms by a non-magnetic spring, with the armatures being so arranged as to overlap each other considerably in order to mutually assist each other in their magnetic coupling when the operating coil is excited.

3,771,084

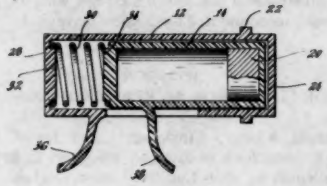
MAGNETIC RETRIEVAL DEVICE

Robert H. Thon, Palmyra, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Aug. 25, 1972, Ser. No. 283,872

Int. Cl. H01f *7/20*

U.S. Cl. 335—285 **10 Claims**



A magnetic retrieval device including an outer sleeve of cylindrical configuration and an inner sleeve of cylindrical configuration, the inner sleeve being slidably mounted within the outer sleeve. The outer sleeve includes a first finger support mounted thereon and a slot contained therein and mounted just forward of the first finger support. A second finger support is mounted to the inner sleeve and is slidably adjustable within the slot of the outer sleeve. The inner sleeve includes a magnet mounted in the forward portion thereof, the inner sleeve and outer sleeve having relative movement by manipulation of the finger supports for placing the magnet between a first position attracting particles to the front face of the outer sleeve and a second position sufficiently distant from the front face such that the magnetic field of the magnet no longer attracts particles thereto. The outer sleeve may include a spoiler for preventing movement of particles along the sleeve upon movement of the inner sleeve.

3,771,085

DEVIATION DETECTING APPARATUS

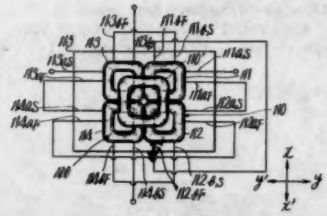
Takeshi Hojo, Fujisawa-shi, and Shin-Ichi Kawada, Yokohama-shi, both of Japan, assignors to Kabushikikaisha Tokyo Keiki (Tokyo Keiki Co., Ltd.), Tokyo, Japan

Filed Aug. 2, 1972, Ser. No. 277,399

Claims priority, application Japan, Aug. 10, 1971, 46/60499; Aug. 10, 1971, 46/60497

Int. Cl. H01f *27/28, 21/04*

U.S. Cl. 336—182 **2 Claims**



A deviation detecting apparatus having a primary coil for generating an alternating magnetic field, and a secondary voltage inducing device disposed to oppose said primary coil with a space therebetween and producing a secondary voltage in accordance with the alternating magnetic field caused by said primary coil. In this case, said secondary voltage inducing device consists of four secondary coils, said four secondary coils being arranged in square and made up by winding two electrically insulated wires in parallel, the two first wires of the adjacent two secondary coils being connected to deliver as an output a sum or difference of induced voltages therein and to

form two pairs of winding groups each of said two pairs of winding groups being connected to deliver as an output a sum or difference of induced voltages therein, the two adjacent second wires being connected to deliver as an output a sum or difference of induced voltages therein and to form two pairs of winding groups in a different manner to that in said first wires, said pairs of winding groups being connected in such a manner that a sum or difference of induced voltages therein is delivered as an output.

3,771,086

ELECTRIC COIL CONSISTING OF A CONTINUOUS STRIP-SHAPED CONDUCTOR

Peder Ulrik Poulsen, Esbonderup, 3230 Graested, Denmark

Filed Sept. 7, 1971, Ser. No. 177,999
Claims priority, application Denmark, Sept. 8, 1970, 4594
Int. Cl. H01f *15/10, 27/28*
U.S. Cl. 336—192 **3 Claims**

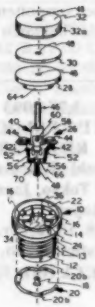
An electric coil consisting of a continuous flat strip-shaped conductor wound together with one or more layers of an insulating material, adapted to insulate adjacent convolutions from each other and insulate the edges of conductive strip from contact with conductive elements in proximity to the coil.

3,771,087

CIRCUIT BREAKER, TRIP MECHANISM AND METHOD FOR MANUFACTURING SAME

William P. Riendeau, Leonardtown, Md., assignor to Aiken Industries, Incorporated, New York, N.Y.

Filed July 6, 1971, Ser. No. 159,930
Int. Cl. H01h *7/02*
U.S. Cl. 337—112 **12 Claims**



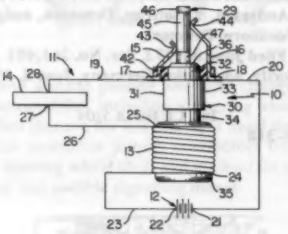
This is a miniature circuit breaker which is wholly contained within a screw-type envelope for a type S fuse. The breaker trip mechanism is of the type which has a resetting plunger, and a current sensing device which moves relative to the plunger. In order to limit the travel of the current sensing device under trip conditions, stop shoulders are formed on the body of the plunger. The current sensing device takes the form of a bimetallic member formed with a leading latch edge and a trailing edge. In order to prevent the trailing edge from engaging a cooperating latch member during resetting of the circuit breaker, a tang projects from the trailing edge across the cooperating latch member. The circuit breaker housing is of one-piece construction, and has an open end through which the trip mechanism is inserted. The trip mechanism incorporates a plunger-biasing coil spring at the bottom of the trip mechanism. In order to retain the compression spring in assembly with the plunger while the trip mechanism is dropped into the open end of the breaker housing, the spring is frictionally received within a recess formed at the bottom of the plunger. The current sensing device includes a pair of bimetallic pincers embracing the plunger, and one of these pincers is formed with a through cut in order to divert all of the current to the opposed pincer, at least under trip conditions. One of the external electrodes of the breaker is formed of inexpensive round wire stock.

3,771,088

ELECTRICAL SWITCH CONSTRUCTION AND CONTROL SYSTEM UTILIZING THE SAME

Boyd P. Sliger, Concord, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed June 30, 1972, Ser. No. 267,957
Int. Cl. H01h *37/46*
U.S. Cl. 337—123 **20 Claims**



An electrical switch construction having a pair of electrical contacts carried by a support and being adapted to be disposed in spaced relation relative to each other. A condition responsive device is carried by the support and has a movable member that moves relative to the support in response to changes in conditions being sensed by the device. The member has at least one part thereof formed of electrical conductive material and has at least another part thereof formed of electrically non-conductive material. Such member is disposed between the contacts whereby the one part thereof is adapted to be in contact with the contacts to provide an electrical circuit therebetween when the device senses a certain condition and the other part is adapted to be in contact with at least one of the contact means to prevent an electrical circuit between the contacts when the device senses another condition.

3,771,089

FLUID FUSE

Edwin A. Link, Waukesha, Wis., assignor to RTE Corporation, Waukesha, Wis.

Filed May 13, 1970, Ser. No. 36,781
Int. Cl. H01h *85/40*
U.S. Cl. 337—277 **8 Claims**

A fluid fuse having an electric terminal at each end of a tubular dielectric housing, an electrically conductive member electrically connected to each of said terminals, an electrically conductive fusible element interconnecting the members, a barrier positioned adjacent to the element to separate the housing into high and low pressure chambers, and an arc extinguishing fluid, either liquid or gas, confined under pres-

sure within the high pressure chamber. The barrier is located close enough to the element so that the heat of the arc on rupture of the fusible element will form a hole in the barrier releasing the arc extinguishing fluid to extinguish the arc between the members.

3,771,090

TEMPERATURE RESPONSIVE SWITCH

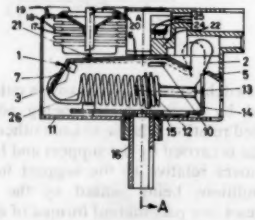
Jens Nicolai Andresen, V. Sottrup, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed June 8, 1972, Ser. No. 261,491

Claims priority, application Germany, June 8, 1971, P 21 28 415.1

Int. Cl. H01h *5/04*

U.S. Cl. 337—318 **4 Claims**



The invention relates to a temperature responsive switch assembly of the type having a pivotally mounted lever attached to a snap action spring with the lever being pivotally movable in response to opposing forces provided by a rated spring and a vapor containing working element. The moving contact of the switch is attached to the lever. Although the vapor pressure curve of the working element is not linear, the temperature differentials between the switch on and off temperatures are kept substantially constant for the whole range of nominal temperature settings for the system. This object is achieved by an arrangement in which the line of force of the rated spring forms an acute angle with the lever which angle is of a selected magnitude that compensates for the nonlinearity of the vapor pressure curve of the working element is provided.

3,771,091

POTTED METAL OXIDE VARISTOR

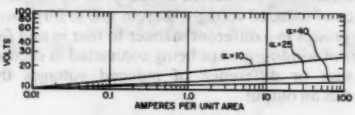
John D. Harnden, Jr., Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 185,723, Oct. 1, 1971, abandoned. This application Oct. 31, 1972, Ser. No. 302,539

Int. Cl. H01c *7/10*

U.S. Cl. 338—20 **10 Claims**

A metal oxide varistor has a high thermal conductivity potting material encapsulating completely the metal oxide varistor and a portion of the leads therefrom, a pair of metal plates spaced in a generally parallel reslationship to the opposite major surfaces of the varistor and bonded thereto by the potting material, and one of the plates having at least a pair of mounting holes therein or other suitable means.



3,771,092

CONTACTLESS SWITCHING DEVICE

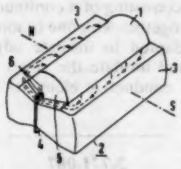
Karl Greger, Amberg, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munchen, Germany

Filed Nov. 22, 1971, Ser. No. 200,769

Claims priority, application Germany, Nov. 23, 1970, P 20 57 483.8

Int. Cl. H01c *7/16*

U.S. Cl. 338—32 R **6 Claims**



A contactless switching device has a permanent magnet which is rotatably mounted so that it is movable relative to a magnetic field dependent resistance which is located between the return poles of a return yoke. The permanent magnet is rotatably mounted in the manner of a rotatably mounted coil between the return poles of the return yoke and is magnetized in a diameter of the circle of rotation. Rotation of the permanent magnet varies the component of the magnetic field effective via the return poles between a maximum and substantially zero.

3,771,093

MULTIPLE STAGE INTERLOCK TYPE VARIABLE RESISTOR

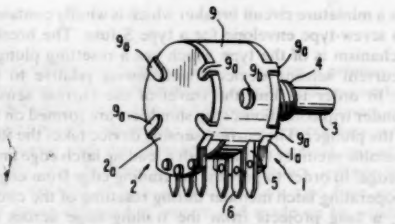
Sachio Ishikawa; Hiroaki Komatsu; Junichi Imura, and Hiroshi Takemi, all of Tokyo, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Aug. 28, 1972, Ser. No. 283,999

Claims priority, application Japan, Aug. 28, 1971, 46/65969

Int. Cl. H01c *9/02*

U.S. Cl. 338—132 **4 Claims**



A cover, surrounding commonly coupled slider for paired resistors actuated by a common actuator, carries at least one

hole permitting access to an adjusting mechanism for shifting one slider relative to the other and to overcome interlock error in a multi-stage interlock type variable resistor.

3,771,094

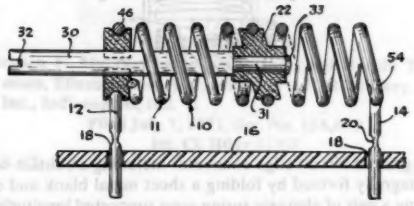
ADJUSTABLE ELECTRICAL RESISTOR HAVING A HELICAL COIL OF RESISTANCE MATERIAL IN THREADED, BIASED ENGAGEMENT WITH A ROTATABLE INTERNAL CONTACT MEMBER

Samuel A. Johnston, Fontana, Wis., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation-in-part of Ser. No. 108,503, Jan. 21, 1971, abandoned. This application Dec. 27, 1971, Ser. No. 212,686

Int. Cl. H01c *5/02*

U.S. Cl. 338—143 **12 Claims**



A helical resistance element of wire sufficiently stiff to make the element self-supporting is traversed by a contact member threadedly engaging the inside of the helix at circumferentially spaced points. Contact is maintained by the fact that the member is a tight fit in the element, actually expanding it somewhat from its normal diameter. The contact member is mounted on a conductive shaft, for which a low friction, high pressure and high conductivity bearing of silver graphite material is provided at one end of the helix, external connection to the contact member being made through the bearing and the shaft. Assembly is done by temporarily expanding the end turns of the coil to permit insertion of the associated parts, which are retained by the spring contraction of the coil when released.

3,771,095

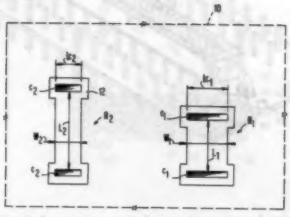
MONOLITHIC INTEGRATED CIRCUIT RESISTOR DESIGN FOR OPTIMUM RESISTOR TRACKING

Harry C. Calhoun, and Carl L. Kaufman, both of Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 21, 1972, Ser. No. 317,492

Int. Cl. H01c *1/16*

U.S. Cl. 338—320 **7 Claims**



An integrated circuit including integrated circuit resistors whose geometries are designed in accordance with the method of significant weights in order to optimize resistor tracking relative to process-induced changes in resistor values. The result of this method is an integrated circuit in which different resistors have different, rather than the same, widths.

3,771,096

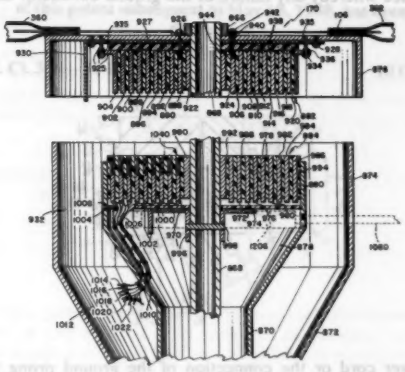
VIDEO AND AUDIO PASSING AND LANE CHANGING SIGNALING SYSTEM FOR VEHICLES

Vincent J. Walter, 1557 Woodland Ave., Wichita, Kans.

Continuation of Ser. No. 501,405, Oct. 22, 1965, abandoned. This application Apr. 3, 1969, Ser. No. 822,800

Int. Cl. H01r *39/26*

U.S. Cl. 339—3 **10 Claims**



A visual and audible passing and lane changing signalling system for automobiles, including a steering wheel having opposite switches thereon for left and right hand signalling; a rotary electrical connector joining conductors from the wheel through the steering wheel shaft and method for making same; and the visual and audible signalling means.

3,771,097

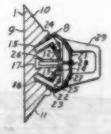
ELECTRICAL POWER DISTRIBUTION

Robert A. Luxton, 444 Iana St., Honolulu, Hawaii

Continuation-in-part of Ser. No. 883,155, Dec. 8, 1969. This application Apr. 26, 1971, Ser. No. 137,152

Int. Cl. H01r *3/06*, *11/02*

U.S. Cl. 339—14 P **11 Claims**



This invention is for an electrical power distribution system consisting of a plurality of plug-in receptacles in a continuous line including plugs etc. which are designed to fit anywhere along the line of receptacles. The attachment plug for the system is specially designed to snap into any place along the receptacle or receptacles and thus be latched into good connection with an electrical power source. Various fittings are provided such as current transfer and end caps.

3,771,098

GROUND WIRE MONITORING SYSTEM

Robert H. Dempsey, Napa, Calif., assignor to Neurodyne-Dempsey, Inc., Napa, Calif.

Filed May 16, 1972, Ser. No. 253,892

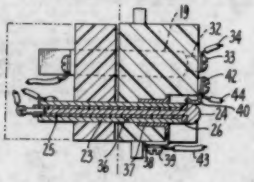
Int. Cl. H01r *3/06*, *17/18*

U.S. Cl. 339—14 R **3 Claims**

A means for monitoring the integrity of a ground circuit in the connection of an electrical apparatus to an electric utility outlet through a power cord and plug. The means comprises a

wall receptacle having two contacts, each of which is connected to the utility ground conductor, and a plug having a ground prong comprising two members which are adapted, respectively, for engaging the two ground contacts of the wall receptacle.

One of the ground prong members is connected in a conventional manner through the power cord of the apparatus to the apparatus case. The second ground prong member is connected to the apparatus case through a continuity-sensing device whereby any failure of the ground conductor and the



power cord or the connection of the ground prong to the ground contact and the wall receptacle will be immediately detected.

In an alternative embodiment, the second power cord ground conductor is connected directly to the apparatus case and through the plug and wall receptacles to a remote continuity-sensing device to monitor the integrity of the ground circuit not only in the apparatus power cord and plug-to-wall receptacle connection, but also in the utility wiring of the structure in which the apparatus is located.

3,771,099

SINGLE-POLE ELECTRICAL CONNECTOR

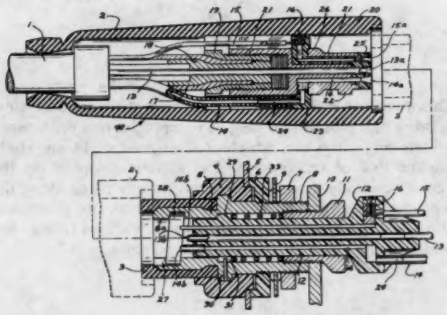
Wilhelm Dinse, Konigsreihe, Germany

Filed July 1, 1971, Ser. No. 158,856

Claims priority, application Germany, Aug. 20, 1970, P 20 41 290.2

Int. Cl. H01r *13/54*

U.S. Cl. 339—16 R **9 Claims**



An electrical connector for electrical and other supply connections, the connections interfitting endwise to prevent relative rotation, and a housing part to move endwise ar rotatably of one connector to receive and interlock with the other connector to hold the connectors firmly together.

3,771,100

PRINTED CIRCUIT BRIDGING CONNECTOR

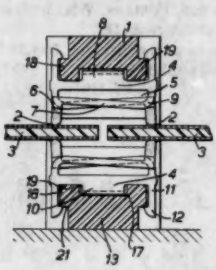
Norman Leonard Reed, Cheshunt, England, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 8, 1971, Ser. No. 196,320

Claims priority, application Great Britain, Nov. 20, 1971, 55,236/70

Int. Cl. H01r *13/54*; H05k *1/02*

U.S. Cl. 339—17 LM **4 Claims**



A printed circuit edge connector including a contact which is integrally formed by folding a sheet metal blank and comprising a pair of elongate spring arms supported longitudinally spaced apart at one of their ends by an elongate body portion, the arms extending in opposite directions away from their supported ends towards the supported end of the other arm so that they overlap or cross. Contact portions are located at the free ends of each arm adjacent the supported end of the other arm, the contact portions facing away from the body, and the spring arms being flexible in a sense to permit movement of the contact portions to and away from the body portion. The contact is mounted in a slot in a carrier block of insulating material by latch arms formed on the body portion to project away from the spring arms and engage a shoulder formed on the block.

3,771,101

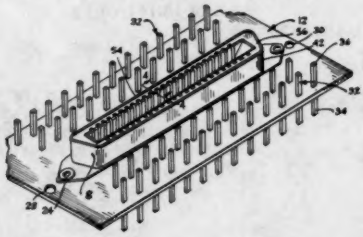
ELECTRONIC CIRCUIT ASSEMBLIES AND METHOD OF MANUFACTURE

Lujene Elkins, Chicago, Ill., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed June 21, 1971, Ser. No. 154,767

Int. Cl. H05k *1/02*

U.S. Cl. 339—17 C **3 Claims**



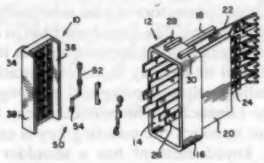
An electrical connector wire-wrap module for permitting electrical access from either the front or the rear of a high contact density miniature connector to each of the contact tails of the connector by one or more relatively low-gauge, wire-wrap connections affixed to one or more of a plurality of wire-wrap terminal posts arranged in a relatively low density configuration on a printed circuit board in close juxtaposition to the connector. The connector and wire-wrap posts are af-

fixed to the printed circuit board with the relatively fragile, closely spaced contact tails of the connector extending from the upper to the lower surface of the board through apertures in the board. The wire-wrap terminal posts are in turn arranged in a low density configuration around the periphery of the connector and also extend through apertures in the board with sections of each post being well above and well below the board surfaces to permit relatively low-gauge, wire-wrap connections to be made thereto either frontwardly or rearwardly of the connector. The tails of the connector contacts are electrically coupled to specified ones of the wire-wrap posts by means of conductive circuit paths carried on the lower surface of the printed circuit board, each path terminating in an apertured conductive terminal pad aligned with one of the apertures through which the contact tails and terminal posts extend with solder bridges electrically connecting the pads with their associated contact tails or terminal posts.

3,771,102
BUSSING BLOCK

Stephen F. Murray, Indianapolis, Ind., and Harold T. Simmons, Elizabethtown, Ky., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed July 1, 1971, Ser. No. 158,879
Int. Cl. H01r *31/08*
U.S. Cl. 339—19 **8 Claims**

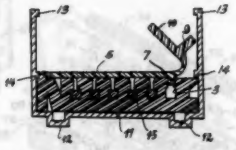


Individual terminal stations receive electrical terminals with bussing bars bridging selected terminal stations, the bars having fingers extending to the selected stations.

3,771,103
SYSTEM FOR THE INSTALLATION OF ELECTRICAL CABLES

Gusbertus Attema, Gorinchem, Netherlands, assignor to Researchcentrum Ogomat N.V., Gorinchem, Netherlands

Filed Jan. 24, 1972, Ser. No. 219,996
Claims priority, application Netherlands, Jan. 26, 1971, 7100995; June 11, 1971, 7108031
Int. Cl. H01r *9/00*
U.S. Cl. 339—21 R **27 Claims**

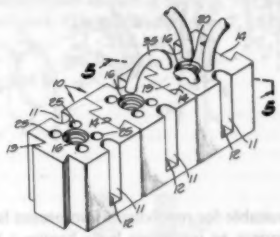


A system for installation of electrical conductors in buildings, comprising a flat cable having a base with open grooves in which bare conductors may be inserted, further comprising cable ducts or channels into which such cables may be introduced, which ducts may be attached to a wall or may be suspended on a ceiling in a building, and further comprising contact means which may be detachably clamped in a cable duct, said contact means having contact pins or strips which contact the conductors of such a cable when this contact means is clamped in the cable duct.

3,771,104
MODULAR ELEMENT FOR A SOLDERLESS EXPANDABLE TERMINAL STRIP

Marvin A. Clark, 7902 Woodley Ave., Van Nuys, Calif.

Filed Aug. 10, 1971, Ser. No. 170,494The portion of the term of this patent subsequent to May 18, 1988, has been disclaimed.
Int. Cl. H01r *29/00, 9/08*
U.S. Cl. 339—31 R **10 Claims**

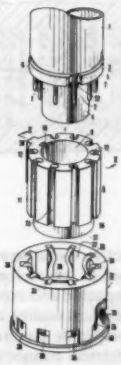


A modular element for use in a solderless expandable terminal strip molded from non-conductive material and formed with interlocking tenons and mortises. Each module has a screw seated in a well into which other conductor seating wells converge at an acute angle such that the screw crest assembled in the well cuts through the conductor insulation and into the conductor itself thereby making a firm anchorage as well as multiple electrical contacts therewith.

3,771,105
ADAPTERS FOR THE TERMINAL PINS OF ELECTRON TUBES

Eiichi Yamazaki, Ichihara, and Takao Kawamura, Mobara, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 23, 1972, Ser. No. 228,649
Int. Cl. H01r *13/50, 13/64*
U.S. Cl. 339—36 **2 Claims**

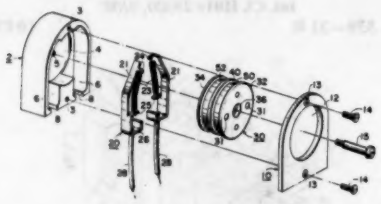


An adapter for protecting terminal pins of an electron tube is comprised by a cylindrical body having a central bore of a diameter sufficient to accommodate the exhaust member at the bottom of the electronic tube and a plurality of axially extending grooves provided on the periphery of the cylindrical body at positions corresponding to the terminal pins.

3,771,106
SOCKET SUITED FOR REVOLVING THE LAMP ATTACHED THERETO

Akio Matsumoto, Otsu; Seinosuke Tonogai, Shiga, and Kosaku Morishita, Nara, all of Japan, assignors to New Nippon Electric Company Ltd., Osaka, Japan

Filed Apr. 7, 1972, Ser. No. 241,962
Claims priority, application Japan, Apr. 14, 1971, 46/28924 (utility model); Apr. 14, 1971, 46/28925 (utility model)
Int. Cl. H01r 33/08
U.S. Cl. 339—52 3 Claims

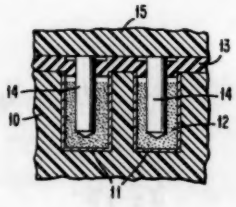


A socket suitable for revolving a fluorescent lamp attached thereto comprises an insulating body having a first recessed portion therein for receiving a rotator in which a pair of base pins of the lamp can be inserted and having a pair of second recessed portions therein for receiving a stator to which lead-in wires for a power supply are connected, means for pivotally supporting the rotator within the first recessed portion, and a pair of conductive rings, insulated from each other, set around an insulating disc of the rotator and elastically engaged with conductive spring means of the stator so as to make electrical connection between the stator and the rotator.

3,771,107
CONDUCTIVE METAL POWDER CONNECTOR

Kenneth R. Forster, Endicott, and Wendell J. Wheeler, Endwell, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 10, 1971, Ser. No. 206,830
Int. Cl. H01r 9/08
U.S. Cl. 339—96 3 Claims

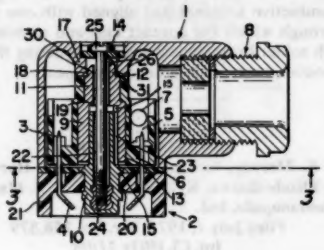


An electrically conductive metal powder interconnector incorporating a powder bed of submicron diameter nickel/gold particulate powders compacted and contained within a socket and encapsulated by a resilient sealing element. The structure provides a detachably pluggable electrical connector providing a low impedance electrical connection between electrical leads of component elements and other devices to which the elements are attached. Optionally, the structure can function as an interface with connector holes providing the electrica' connection between the electrical leads which are located o . opposite sides of the interface. Alternatively, the structure can function as a female connector for establishing an electrical contact between the connector and a male pin of a circuit module inserted into the connector.

3,771,108
PRESETTABLE POLARIZING KEY FOR ELECTRICAL CONNECTORS

Helmut Hubert Haffner, Heilbronn; Lothar Karl Kannheiser, Neckarsulm, and Kuno Wilhelm Schmied, Eschenau, all of Germany, assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Mar. 27, 1972, Ser. No. 238,394
Claims priority, application Germany, Apr. 8, 1971, P 21 17 315.9
Int. Cl. H01r 13/64
U.S. Cl. 339—113 R 1 Claim

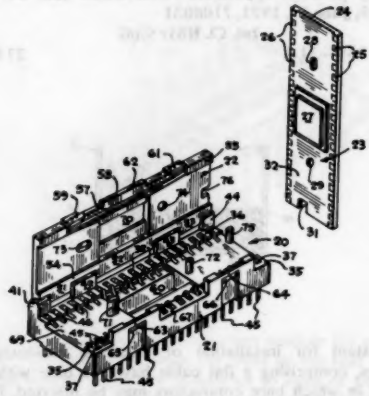


A polarizing or keying system wherein the keyed elements in a mating pair of connectors can be selectively preset in any of a number of positions. The keyed element in one connector is polygonal in external cross-section, so that it can be selectively inserted with its keyway in various rotational positions in a correspondingly shaped polygonal opening in the dielectric body of the connector. The connector can then be mated only with a unit in which the coacting key is correspondingly oriented. The keyed element has a shoulder engaging the dielectric body; when the keyed element is retained by fastening means engaging an outer shell, the dielectric body is in turn retained in the shell by the keyed element.

3,771,109
ELECTRICAL CONNECTOR FOR INTEGRATED CIRCUIT DEVICE

Richard Bruckner, West Chester, and John L. Tansky, Collingdale, both of Pa., assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Filed May 1, 1972, Ser. No. 248,869
Int. Cl. H01r 13/50; H05k 1/16
U.S. Cl. 339—174 10 Claims



An electrical connector affording a working cavity for a flat integrated circuit device, requiring no tools for mounting or

demounting of the device, and assuring positive orientation of the device in the connector. The connector comprises a one-piece unitary insulator lid hinged to a one-piece unitary insulator base; the lid clamps the integrated circuit device against a plurality of metal contact elements mounted in the base. The contact elements are individually mountable in and removable from the base, by direct insertion and extraction, and afford a wiping contact action ending in high pressure contact as the cover is closed. An integral latch, formed in the free ends of the base and cover members, latches the cover closed, but is finger-pressure releasable for replacement of the integrated circuit devices.

3,771,110

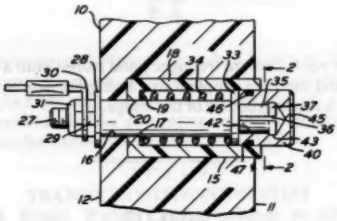
ELECTRICAL CONTACT PINS

Robert T. Reed, Moorestown, N.J., assignor to Walton Products, Inc., Broomall, Pa.

Filed Nov. 23, 1971, Ser. No. 201,506

Int. Cl. H01r *13/50, 11/22*

U.S. Cl. 339—214 S **9 Claims**



An electrical contact pin construction is provided which is particularly suited for use in circuits of railroad cars which are coupled and uncoupled and which cannot have exposed electrically live contact pins, and which includes a slidably mounted electrical contact pin with a readily replaceable contact accessible for replacement without the necessity for disassembly of the pin or of the housing in which the contact pin is mounted, a watertight construction being provided by sealing the contact pin.

3,771,111

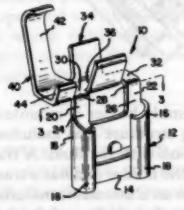
FLAG TYPE ELECTRICAL TERMINAL

James Pritulsky, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed June 12, 1972, Ser. No. 261,843

Int. Cl. H01r *15/12*

U.S. Cl. 339—223 R **9 Claims**



The present invention relates to a stamped and formed flag type electrical terminal comprising a contact portion, a pair of spaced apart support arms integral with and extending coplanarly from the contact portion, and a crimp portion extending between the ends of the support arms which have been bent substantially right-angularly of the contact portion. Elongation of the crimp portion as a result of crimping causes the bent end portions of the support arms to be further displaced one from the other, and is accommodated by deformation of the portions of the support arms adjacent the contact portion in opposite rotational directions about their respective axes to prevent deformation of the contact portion.

3,771,112

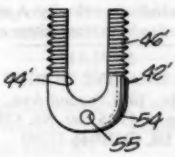
CABLE SPLICE CLAMPING AND BONDING ASSEMBLY

John T. Thompson, 244 Loring St., Los Angeles, Calif., and George W. Gillemot, 2331 20th St., Santa Monica, Calif.

Continuation of Ser. No. 884,874, Jan. 26, 1970, abandoned, which is a continuation-in-part of Ser. No. 797,943, Feb. 10, 1969, abandoned. This application Apr. 7, 1972, Ser. No. 242,128

Int. Cl. H01r *11/10*

U.S. Cl. 339—244 B **3 Claims**



A cable splice clamping and bonding assembly for use with a pair of shielded cable ends, at least some conductors of which are to be spliced together. A length of each cable sheath is removed to expose a short ringlet of the metallic shield with ringlets firmly and securely clamped together in overlapping relation crosswise of a non-wrenchable split bolt connector. The connector clamping ring lacks wrench engaging surfaces but is roughened to facilitate tightening of the connector solely by finger pressure without risk of damage to the foil-like cable shields or to the underlying conductors. The connector bonds the shields together and transfers stresses directly between the main bodies of the two cables without risk of strain on the conductor splice connections.

3,771,113

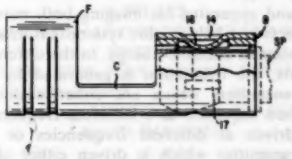
SPRING ACTION TERMINAL WITH LOCKED BARREL

Grant Woodrow Cronce, Port Huron, Mich., assignor to Eltra Corporation, Toledo, Ohio

Filed Oct. 28, 1971, Ser. No. 193,247

Int. Cl. H01r *11/22*

U.S. Cl. 339—256 C **2 Claims**



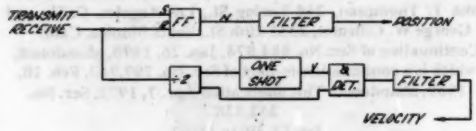
A spring action terminal for connection to spark plugs made from a single piece of material, which has a locked barrel provided by a detent which also engages the spark plug.

3,771,114

ACCOUSTICAL TAPE LOOP SENSOR

William Arthur Buchan, El Toro, Calif., and John Joseph Ring, Mission Viejo, Calif., assignor to Century Data Systems, Inc., Anaheim, Calif.

Filed Nov. 11, 1971, Ser. No. 197,867
Int. Cl. G01s 9/68
U.S. Cl. 340—1 R 1 Claim



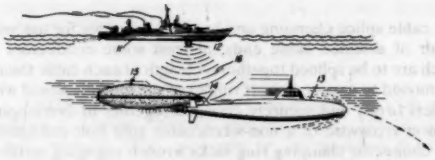
A pulsed ultrasonic ranging system may be used to sense the position and velocity of tape in a vacuum buffer column. The received pulses may be stored in an accumulator to provide position information whereas the value of successive accumulations can be used to indicate velocity. A single piezo-electric transducer can be used as both transmitter and receiver.

3,771,115

SIMULATED SUBMARINE TARGET APPARATUS

Hugh F. McLinden, Jr., 1077 Second Ave., Clula Vista, Calif.

Filed Jan. 4, 1966, Ser. No. 518,731
Int. Cl. H04b 11/00
U.S. Cl. 340—5 D 4 Claims



A countermeasure device for submarines intended to interfere with and jam active sonar ranging by an enemy. A viscous, gelatinous material having metallic particles suspended through it, is ejected by the submarine in such a manner that it forms a hollow bag-like structure which is filled with water. The structure has substantially the same specific gravity as seawater so that it will float at whatever depth it is placed and in so doing will give the same sonar response as a real submarine.

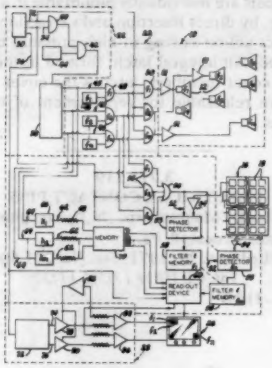
3,771,116

METHOD AND APPARATUS FOR IMAGING STATIONARY AND MOVING OBJECTS

Harry Robert Farrah, Oak Park, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Jan. 12, 1972, Ser. No. 217,156
Int. Cl. G01s 9/66
U.S. Cl. 340—5 H 22 Claims

Method and apparatus for imaging both moving and stationary objects in a holographic system that irradiates an object with coherent acoustic energy. In the different disclosed embodiments, the irradiation is generated by an array of acoustic transmitters which are either each driven in a predetermined sequence at a different frequency or simultaneously driven at different frequencies or by a single scanning transmitter which is driven either at a different frequency in each of several selected scanning positions or at a continuously varying frequency. This reflected radiation is detected by a receiver array which develops corresponding electric signals. A processing control provides phase comparison between the detected signals and a reference frequency signal and also filtering to develop an imaging signal corresponding to the amplitude of the receive signal and the phase difference between the two signals. These imaging signals are developed



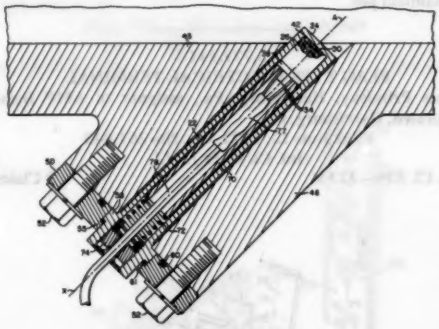
in sets for each discrete frequency and stored until a readout is wanted and then are supplied to a hologram display device to facilitate a reconstruction of the image.

3,771,117

TRANSDUCER INSTALLATION

Thomas N. Shaffer, Silver Spring; Charles R. Wilson, Glen Burnie, and Lawrence G. Wright, Pasadena, all of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 1, 1972, Ser. No. 230,719
Int. Cl. H04b 13/00
U.S. Cl. 340—8 R 18 Claims



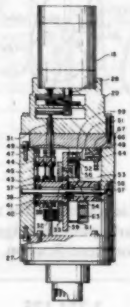
A transducer assembly holder is mounted through the wall of a fluid conveying structure and includes an acoustic window in communication with the fluid. A transducer assembly is positioned within the holder and has a transducer active element encapsulated in an elastomeric material. The assembly is positioned up against the window of the holder and a spring force is applied to the assembly through a spacer tube or rod. The arrangement is such that the spring force is transferred evenly over the encapsulating elastomeric material and a pressure bond is created between the transducer active element and the acoustic window, such couplings being essential for proper transducer operation.

3,771,118

BOREHOLE ORIENTATION TOOL

Henry P. Lichte, Jr., and James M. Lindsey, both of Houston, Tex., assignors to Sperry-Sun Well Surveying Company, Sugar Land, Tex.

Filed Nov. 21, 1969, Ser. No. 879,009
Int. Cl. E21b 47/022; G01c 9/00
U.S. Cl. 340—18 R 10 Claims



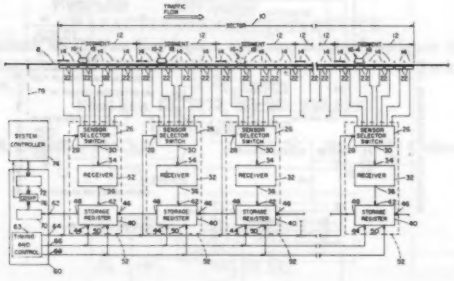
The particular embodiment described herein as illustrative of one form of the invention utilizes a device for detecting the angular position and directional orientation of a housing within a wellbore and for generating a signal indicative of such information for transmission to the earth's surface.

3,771,119

TRANSIT MONITORING SYSTEM

Robert R. Evans, Wyland, Mass., assignor to Alden Self-Transit Systems Corporation, Milford, Mass.

Filed June 22, 1972, Ser. No. 265,344
Int. Cl. B61l 25/00; G08g 1/12
U.S. Cl. 340—23 16 Claims



Vehicles with beacon transmitters are detected by wayside antennas. Code operated switches selectively connect antennas to receivers which indicate vehicle occupancy of associated increments of way. Stored vehicle data is serially shifted to a processor unit.

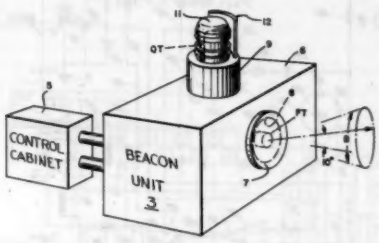
3,771,120

AIRPORT RUNWAY APPROACH AND REFERENCE LIGHTING SYSTEM

Robert P. Bonazoli, Hamilton, and Donald I. Coggins, Melrose, both of Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed Dec. 27, 1971, Ser. No. 212,190
Int. Cl. G08g 5/00
U.S. Cl. 340—25 12 Claims

An airport beacon unit includes an omnidirectional or wide angle flashing lamp for aiding pilot location of an airport runway threshold, and a directional flashing lamp for guiding the final approach to the runway. Both lamps are triggered gas discharge devices connected in shunt and are supplied from a common storage capacitor charged from a power supply. An externally supplied trigger signal first initiates discharge of



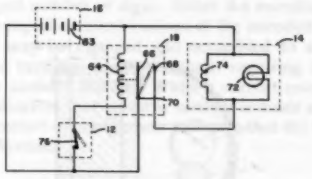
the directional lamp and an intensity control circuit then initiates discharge of the omnidirectional lamp after an interval predetermined by the desired intensity of the directional lamp, flashing of the directional lamp being terminated by flashing of the omnidirectional lamp.

3,771,121

PRESSURE SENSING APPARATUS

Thomas E. Lohr, Warren, Mich., assignor to Allied Chemical Corporation, New York, N.Y.

Filed Aug. 7, 1972, Ser. No. 278,503
Int. Cl. G08b 21/00
U.S. Cl. 340—52 R 5 Claims



A pressure sensing means responsive to gas pressure within a gas containing vessel of a motor vehicle's inflatible bag restraint system is connected in parallel with a signal means located within the passenger compartment of the vehicle. The connection is such that the signal means receives and becomes energized with power from an electrical power source when the sensing means shifts from a conductive to a non-conductive mode. Normal gas pressures within the vessel maintain the pressure sensing means in the conductive mode. If gas pressure in the vessel falls below a preselected pressure, the pressure sensing means shifts to its non-conductive mode, whereby the signal means becomes energized and serves to inform passengers of the vehicle that the gas pressure is dangerously low.

3,771,122

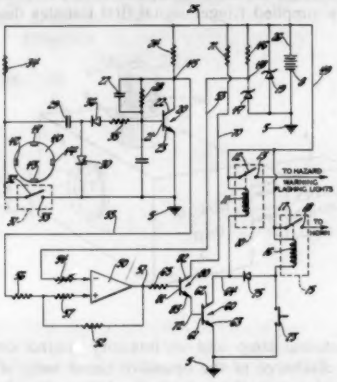
MOTOR VEHICLE AUTOMATIC HAZARD WARNING SYSTEM

Walter J. Sattler, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 11, 1972, Ser. No. 280,068
Int. Cl. B60g 1/54
U.S. Cl. 340—62 4 Claims

A motor vehicle automatic hazard warning system for automatically energizing the hazard warning flasher lights and horn at a predetermined speed. An operational amplifier responsive to a vehicle speed signal and a reference signal produces a control signal at the predetermined vehicle speed.

The control signal triggers a switching transistor conductive to complete an energizing circuit for the operating coil of each



an electrical relay which establishes an energizing circuit for the hazard warning flasher lights and the horn relay which establishes an energizing circuit for the horn.

3,771,123

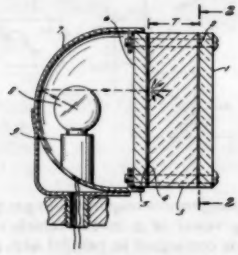
OPTICAL FLASHING LIGHT SIMULATOR AND ALERTING DEVICE

Albert Lanes, 207 E. 74th St., New York, N.Y.

Filed Mar. 4, 1971, Ser. No. 120,883

Int. Cl. B60g 9/00

U.S. Cl. 340—104 **10 Claims**



An optical alerting device flashes only when there is relative motion between the device and an observer or sensor. The flashing rate is a function of closing rate and the distance of the observer from the device.

3,771,124

COHERENT OPTICAL PROCESSOR FINGERPRINT IDENTIFICATION APPARATUS

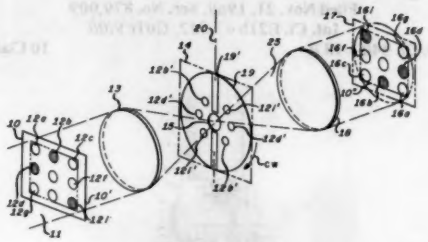
Donald H. McMahon, Carlisle, Mass., assignor to Sperry Rand Corporation, Great Neck, N.Y.

Filed Jan. 21, 1972, Ser. No. 219,716

Int. Cl. G06k 9/13

U.S. Cl. 340—146.3 E **4 Claims**

A fingerprint identification apparatus utilizing coherent optical processing techniques wherein the ridge line orientation in a plurality of preselected finite areas of the fingerprint is inspected by means of a rotating spatial slit filter disposed in the Fourier transform plane of an optical processor for sequentially selecting distinct components of the Fourier transform for transmission to the image plane of the processor whereat a plurality of photodetectors are disposed each corresponding to a discrete sample area. The time delay between a reference orientation of the slit filter and the occurrence of peak light at each detector is noted and a proportional analog or digital



representation thereof is generated for storage and subsequent comparison with similarly obtained signals representative of a fingerprint presented for identification.

3,771,125

ERROR CORRECTING SYSTEM OF A MAGNETIC TAPE UNIT

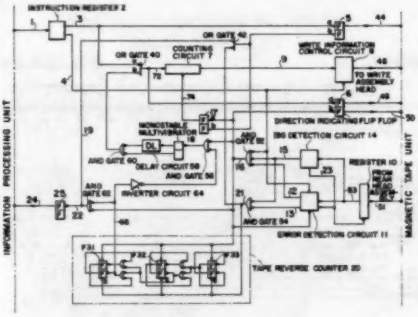
Tetuo Nagahori, Shimoasao, Kawasaki, and Kaoru Kanda, Midori-ku, Yokohama, both of Japan, assignors to Fujitsu, Limited, Kamikodanaka, Kawasaki, Japan

Filed Dec. 27, 1971, Ser. No. 212,203

Claims priority, application Japan, Dec. 28, 1970, 45/127971

Int. Cl. G06f 11/10

U.S. Cl. 340—146.1 F **6 Claims**

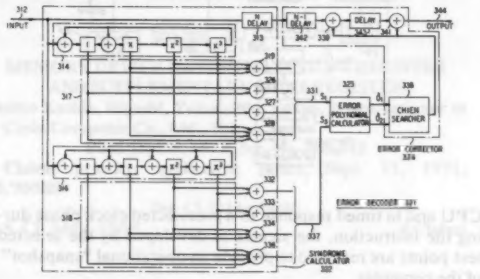


An error correcting system is disclosed for use with a suitable information storage medium such as magnetic tape, whereon at least a data block, a tape mark block and an interblock gap are stored. In particular, the error correcting system operates to provide a write instruction to effect the recording of a tape mark block on the magnetic tape by a suitable write head, to retrieve or read by a suitable read head the previously recorded tape mark block, to detect errors in the recording of the tape mark block and upon error detection, to reverse the direction of the magnetic tape and direct the magnetic tape in the reverse direction for a first predetermined length, to continue to move the magnetic tape in the reverse direction for a second predetermined length while erasing this portion of the magnetic tape and to rewrite a new tape mark block, thus avoiding that portion of the magnetic tape whereat the tape mark block in error was written.

3,771,126
ERROR CORRECTION FOR SELF-SYNCHRONIZED SCRAMBLERS

Garrett Gordon Apple, Jr., Marlboro, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed Apr. 10, 1972, Ser. No. 242,438
Int. Cl. G06f *11/12*
U.S. Cl. 340—146.1 AL 7 Claims

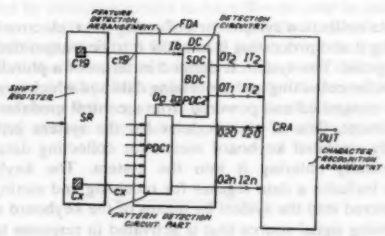


Block codes are scrambled for transmission through a high speed digital channel, which enhances the transmission characteristics of the signal, but errors in the scrambled signal introduced by noise in a transmission channel are multiplied into error patterns when the transmitted signal is descrambled to recover the originally encoded signal. The invention produces a syndrome that is used to locate the random errors introduced by the channel noise. Conventional apparatus locate the random channel errors and produce correction signals. The correction signals are used to reproduce the error patterns for the correction of the descrambled signal. Embodiments are disclosed which correct error multiplication produced by a one-cell scrambler in a digital transmission system.

3,771,127
CHARACTER RECOGNITION DEVICE

Luciaan H. E. Van Heddegem, Edegem, Belgium, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 16, 1972, Ser. No. 226,815
Int. Cl. G06k *9/06*
U.S. Cl. 340—146.3 J 21 Claims

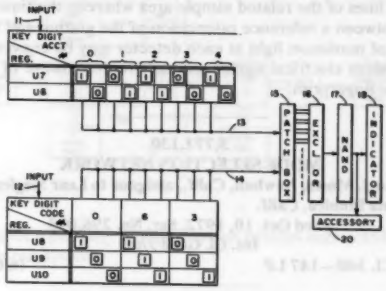


The present synchronization circuit for an optical reader operates as follows: when a pattern read is that of a non-mutilated character, three decision pulses are generated substantially in time coincidence: the first after having recognized a character pattern, the second after having detected the end of a pattern and the third after having detected the beginning of a pattern. When a pattern read corresponds to a mutilated character one or more of these decision pulses are missing and are not in time coincidence. In this case the decision pulse generated first is used to control the decision operation.

3,771,128
METHOD AND APPARATUS FOR CREDIT VERIFICATION

John D. Boardman, Chelmsford, Mass., assignor to Keymatch Computer Corporation, Woburn, Mass.

Filed Nov. 8, 1971, Ser. No. 196,309
Int. Cl. G06f *7/20*
U.S. Cl. 340—146.2 9 Claims

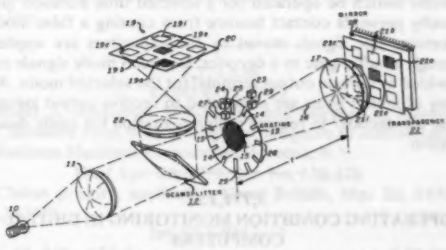


A credit verification operation is achieved by entering an account number which undergoes transformation into encoded form and entering a verification number supplied by the customer which also is subjected to a transformation into encoded form with the two encoding operations being such that a comparison can be made between the format and information content of the two encoded numbers. The verifying number preferably has a lower number of digits than the account number and the transformation involved nevertheless lets a comparison be made between the account number and the verifying number even though in their original form they have an unequal number of digits. Either the encoding transform or the comparison combinations of the encoded form of the numbers may be changed and scrambled to alter the validity of the verifying number without requiring the reissuance of the account number. When a correct comparison occurs the indication that credit is verified is made and conversely the absence of comparison indicates that the transaction is not authorized.

3,771,129
OPTICAL PROCESSOR FINGERPRINT IDENTIFICATION APPARATUS

Donald H. McMahon, Carlisle, Mass., assignor to Sperry Rand Corporation, New York, N.Y.

Filed July 27, 1972, Ser. No. 275,619
Int. Cl. G06k *9/13*
U.S. Cl. 340—146.3 E 11 Claims



An incoherent optical processor fingerprint identification apparatus employing a rotatable grating for inspecting the line orientation in a plurality of preselected finite sample areas of a fingerprint. A detector array including a plurality of detectors each relating to a discrete sample area is disposed to receive

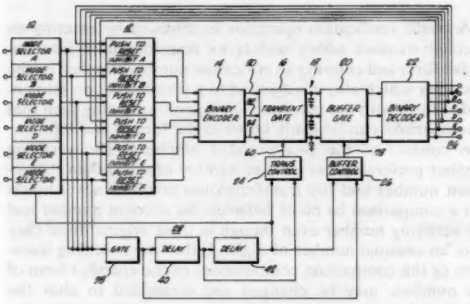
an image of the fingerprint filtered through the grating. An incoherent light source and a lens and retroreflective prism assembly function in cooperation with the grating to produce an image thereof superposed on the grating such that minimum light is propagated to the detector array in the absence of an input fingerprint at the prism whereas in the presence of a fingerprint light is diffracted thereby to filter through the grating to the detectors. Maximum light occurs at each detector under a condition of spatial alignment of the grating lines with the ridge lines of the related sample area whereby the time interval between a reference orientation of the grating and the instant of maximum light at each detector may be converted to equivalent electrical signals uniquely representative of a particular fingerprint.

3,771,130

MODE SELECTION NETWORK

Adrian J. Moses, Newhall, Calif., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed Oct. 10, 1972, Ser. No. 296,093
Int. Cl. G06f *3/02*
U.S. Cl. 340—147 LP **16 Claims**



A mode selection network for permitting one of several different operating modes to be selected is disclosed. The network is designed to accommodate push on/push off button operation and to protect against false operation due to stuck switches, mechanical bouncing of switch contacts, and momentary loss of power. A plurality of identical mode selector circuits are provided for the multiple push bottom switches, one for each of the modes that can be selected, and serve to provide a mode signal to a binary encoder circuit via a push-to-reset gate in response to operation of a switch connected thereto. Binary encoded mode signals are provided to a bank of storage capacitors through a transient gate which is momentarily enabled after a selected time delay following switch initiation. The time delay effectively requires that a mode selector switch be operated for a selected time duration and thereby prevents contact bounce from causing a false mode selection. The signals stored by the capacitors are applied through a buffer gate to a decoder. Decoded mode signals are provided at a single output terminal for the selected mode. An array of inhibit gates are connected to receive output signals from the decoder to require switch operation for mode deactivation.

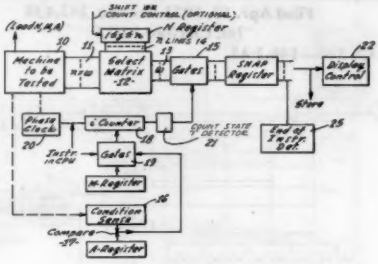
3,771,131

OPERATING CONDITION MONITORING IN DIGITAL COMPUTERS

Andrew T. Ling, Palos Verdes Penninsula, Calif., assignor to Xerox Corporation, El Segundo, Calif.

Filed Apr. 17, 1972, Ser. No. 244,397
Int. Cl. G06f *11/00*
U.S. Cl. 340—172.5 **5 Claims**

In a stored program digital computer, which includes memory, CPU and input/output equipment, and having a plurality of hardwired test points developing signals during operation of computer from which particular test points are selected. Upon execution of a selectable instruction by the CPU and in timed response to a preselected clock phase during the instruction, the signals as developed by the selected test points are received to provide an operational "snapshot" of the computer.

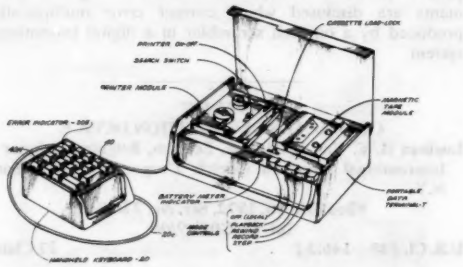


3,771,132

DATA COLLECTION SYSTEM INCLUDING CONTROLLED POWER SWITCHING OF THE DATA COLLECTION MODULES THEREOF

Mathias L. Biewer, Claremont, Calif., assignor to MSI Data Corporation, Montclair, Calif.

Filed Apr. 19, 1971, Ser. No. 135,345
Int. Cl. G06f *3/02*
U.S. Cl. 340—172.5 **34 Claims**



A data collection system for collecting data, electronically encoding it and processing it to allow it to be transmitted to a distant point. The system is defined in terms of a plurality of modules for collecting and processing data and which modules may be controlled and powered from a central modular control element. One of the modules for the system includes manually operated keyboard means for collecting data and electronically entering it into the system. The keyboard module includes a data register for receiving and storing the data entered into the system by means of the keyboard and a local timing signal source that is activated in response to the operation of a key. This module timing signal is coupled by means of a system bus to the control module for activating a control clock pulse source that couples clock pulses onto the system bus that are applied to the keyboard data register along with the data register for the other modules of the system for transferring the data from the keyboard module to the other modules of the system. The other modules may include a magnetic recording module having an individual data register and means for processing any data entered into the register for transmission to a remote point. The system may also include a display means for rendering visible the data entered into the system. The display means may comprise a printer also having

a data register responsive to the central clock pulses for receiving data from the keyboard module. The system may be powered from a central power source such as a battery. For this purpose, the modules may include a power switch that is coupled to be responsive to the keyboard timing signal for applying the power to these modules for the duration of the timing signal.

3,771,133
MEMORY DEVICE HAVING MAIN SHIFT REGISTER AND SUPPLEMENTARY SHIFT REGISTER

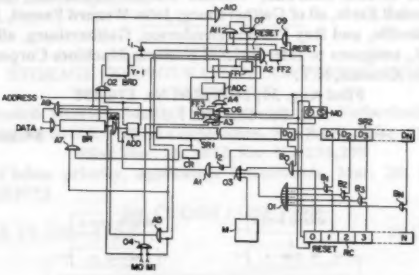
Toshio Kashio, Higashi, Yamato-shi, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Sept. 6, 1972, Ser. No. 286,845

Claims priority, application Japan, Sept. 11, 1971, 46/70585

Int. Cl. G11c *19/00*

U.S. Cl. 340—172.5 **4 Claims**



A memory device including a buffer register for storing input data and a main shift register having addresses arranged in series so as to store input data supplied from said buffer register in a specified address, wherein, in case input data being stored in the main register has more digits than those initially designed for the prescribed address of the main shift register, there is serially connected to the main shift register a supplementary shift register capable of handling numerous digits so as to store said excess digits as a temporary extension of the capacity of the main shift register. There is formed a path of circulatory shifting between the input section of the main shift register and the position of the least significant digit which is detected by detecting means to have flowed over to said supplementary shift register when the specified address of the main shift register is fully filled with inputs from the buffer register and there is connected between the main shift register and supplementary shift register means for disconnecting the supplementary shift register from the main shift register at the beginning of cycle of circulatory shifting in said main shift register.

3,771,134
COMMUNICATION CONTROL DEVICE UTILIZED AS AN INPUT/OUTPUT MODULE FOR A REMOTE TERMINAL SYSTEM

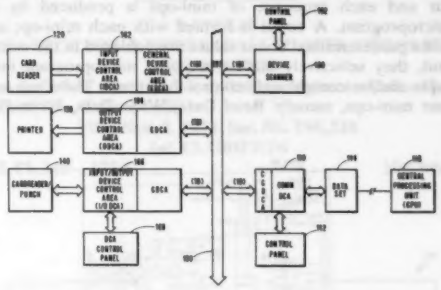
Robert E. Huettner, Acton; Edward B. Tymann, Natick, and Richard Nolin, North Andover, all of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Feb. 12, 1971, Ser. No. 114,852

Int. Cl. G06f *3/04*

U.S. Cl. 340—172.5 **21 Claims**

A modular input/output communication device permits a remote terminal to operate either on-line to a data processing system or off-line as a free standing unit. The remote terminal operates in at least selectable first and second data processing modes with a plurality of input/output devices connected to a common bus system.



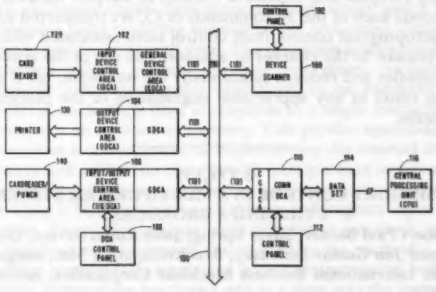
3,771,135
REMOTE TERMINAL SYSTEM

Robert E. Huettner, Acton, and Edward B. Tymann, Natick, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Feb. 12, 1971, Ser. No. 114,912

Int. Cl. G06f *3/04*

U.S. Cl. 340—172.5 **34 Claims**



A remote terminal operates in at least selectable first and second data processing modes with a plurality of input/output devices connected to a common bus system. These modes are established in accordance with the recognition of control characters included within the data being transferred along the bus.

3,771,136
CONTROL UNIT

Michael J. Heneghan, Winchester, and Michael A. Hughes, Chandlers Ford, both of England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 29, 1971, Ser. No. 138,428

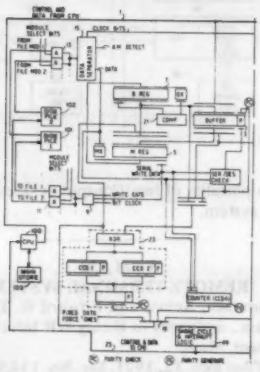
Claims priority, application Great Britain, May 20, 1970, 24,312/70

Int. Cl. G06f *9/12*

U.S. Cl. 340—172.5 **4 Claims**

A significant cost savings is effected in a magnetic disk file control unit with a minimum loss in performance by producing a sequence of control signals, hereinafter referred to as mini-ops, for each of a large number (e.g., 39) of available file commands (often referred to as CCWs). Each mini-op is common to a large number of the commands, and it controls an in-

tegrated control unit (adaptor) or channel control unit during portions of Read, Write and Search CCW executions. The preferred embodiment of the improved control unit has been particularly adapted for use with a microprogrammed processor and each sequence of mini-ops is produced by the microprogram. A count is formed with each mini-op; and, when predetermined count values are achieved in the control unit, they selectively initiate required microprogram interrupts and/or control unit control functions. There are only four mini-ops, namely: Read Data, Write Data, Write Gap,



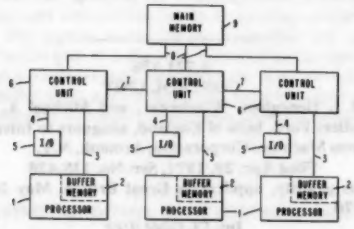
and No-Op. A mini-op is issued for each field which is to be read or written and for each gap which is to be written. No-Ops are issued as required. Prior art control units included very complex and expensive channel or adaptor hardware to decode each of the 39 commands or CCWs transferred under microprogram control from control store associated with the processor to the channel or adaptor. The use of the mini-ops simplifies and reduces substantially the hardware, yet it does not result in any appreciable degradation of the processing system.

3,771,137

MEMORY CONTROL IN A MULTIPURPOSE SYSTEM UTILIZING A BROADCAST

Robert Paul Barner, Silver Spring; John Anton Deveer, Olney, and Jan Gustav Oblonsky, Brookville, all of Md., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 10, 1971, Ser. No. 179,376
Int. Cl. G06f *15/16*
U.S. Cl. 340—172.5 **13 Claims**



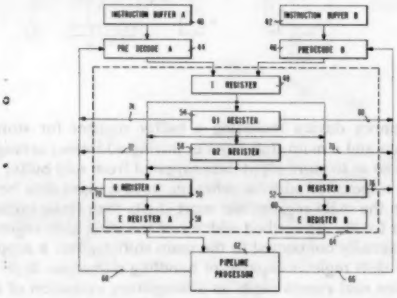
In a multiprocessing computer where a plurality of processors, each with its own buffer memory, share a main memory, a broadcast system provides each processor the capability to query each other processor to determine whether a modified (e.g. updated) version of the desired data is located in another processor's buffer memory. The memory control unit simultaneously initiates a main memory read cycle and a broadcast signal in response to a request for data. If a modified version of the data is found to be in a buffer memory, it is transferred to the main memory by the control unit. The main memory read cycle is then changed to a write cycle so that the modified version replaces the original data. The modified data is then switched onto the memory data bus and transmitted to the requesting processor. Using this system, which only allows one buffer to contain a modified version of any data item, the requesting processor obtains the most current data in one main memory cycle in such a manner that it appears that the data is originating from main memory.

3,771,138

APPARATUS AND METHOD FOR SERIALIZING INSTRUCTIONS FROM TWO INDEPENDENT INSTRUCTION STREAMS

Joseph Orazio Celtruda; William Russell Crosthwait; John Goodell Earle, all of Gaithersburg; John Wenard Fennel, Jr., Beltsville, and Roy Francis Henderson, Gaithersburg, all of Md., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 31, 1971, Ser. No. 176,495
Int. Cl. G06f *9/18*
U.S. Cl. 340—172.5 **3 Claims**



In a pipelined processing unit of a digital computer, an apparatus for sharing the processing capability of the computer between two independent instruction streams is disclosed. The apparatus includes a buffer for instructions of each of the independent instruction streams. These buffers are connected to a selection means which samples various machine resources and determines which instruction of the two independent instruction streams is to be executed next.

3,771,139

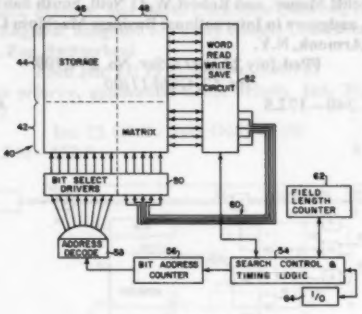
ASSOCIATIVE MEMORY METHOD OF PERFORMING SIMULTANEOUS CONTENT-SEARCHES

David W. Digby, 311 S. Brown Ave., Orlando, Fla.

Filed May 3, 1971, Ser. No. 139,421
Int. Cl. G11c *15/00*
U.S. Cl. 340—172.5 **6 Claims**

Disclosed is a method for performing a "many-to-many" content-addressed search between two extensive bodies of data. The searches are performed in bit-serial word-parallel fashion. A tag-bit is associated with each word for each com-

parison. The value of the tag-bit is determined by a function selected in accordance with the comparison to be performed



and whose value is determined by the value of the bits of the word and comparand.

3,771,140
STORAGE CONFIGURATION COMPRISING SHIFT REGISTERS

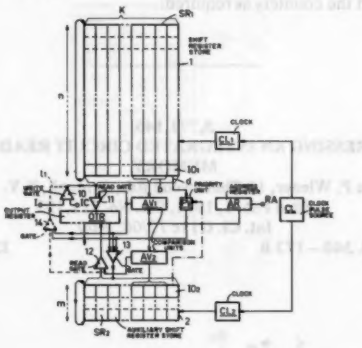
Hendrik Henricus Maria Tromp, Beekbergen, Netherlands, assignor to U.S. Phillips Corporation, New York, N.Y.

Filed Mar. 16, 1972, Ser. No. 235,299

Claims priority, application Netherlands, Mar. 20, 1971, 7103773

Int. Cl. G06f *13/02*, *13/06*

U.S. Cl. 340—172.5 **10 Claims**



A storage configuration comprising a shift-register store having at least *k* circulating shift registers, each shift register having *n* bit locations for storing *n* words having a length of *k* bits, a write-read location, a clock pulse source for supplying clock pulses for controlling the shift-register store, and furthermore comprising selection means for selecting words from the storage configuration on the basis of externally applied selection information, the storage configuration furthermore comprising, in order to reduce the mean access time, an auxiliary shift-register store which can be connected to the shift-register store via gates and which comprises at least *k* circulating shift registers, each shift register having *m* bit locations, *m* being smaller than *n*, for storing *m* words, in particular those *m* words stored in the storage configuration for which requests are repeatedly received, the clock pulse source supplying pulses for controlling the auxiliary shift-register store such that result of a selection in the storage configuration is usually a word directly from the auxiliary shift-register store. It is furthermore possible to use priorities as regards the question which words will be stored or not, or will remain stored or not, in the auxiliary shift-register store.

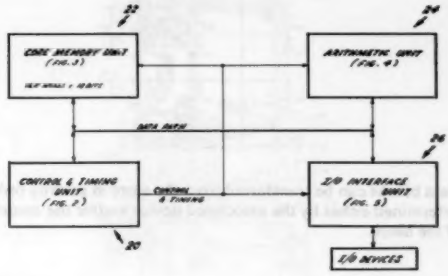
3,771,141
DATA PROCESSOR WITH PARALLEL OPERATIONS PER INSTRUCTION

Glen J. Culler, Santa Barbara, Calif., assignor to Culler-Harrison, Inc., Goleta, Calif.

Filed Nov. 8, 1971, Ser. No. 196,310

Int. Cl. G06f *9/16*

U.S. Cl. 340—172.5 **10 Claims**



MAIN BLOCK DIAGRAM

An electronic digital data processor particularly useful for performing tasks requiring substantial list processing computation in real (or neat real) time. The processor is organized in a manner which permits multiple operations, including arithmetic and data transfer operations, to be executed in parallel at each clock time in response to a single instruction drawn from an instruction memory. This parallel operation is achieved as a consequence of implementing the internal data registers and arithmetic circuits with multiple data inputs and by controlling them in response to a particular instruction format. Data is held constantly variable at each register input bit position. The particular data input selected at any clock time for transfer into a register is determined by the particular instruction concurrently contained within an instruction buffer register. Instructions are drawn one at a time into the instruction buffer from a high speed internal instruction memory which in turn is normally loaded, one instruction block at a time, from a core memory. The instruction format includes multiple fields which separately identify operations to be executed in parallel.

3,771,142
DIGITAL DATA STORAGE SYSTEM

John F. Minshull, Winchester, and Alan S. Murphy, Chandler's Ford, both of England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 1, 1972, Ser. No. 248,835

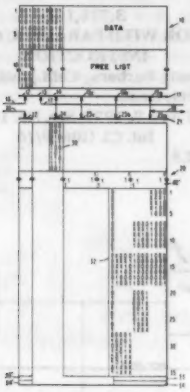
Claims priority, application Great Britain, May 5, 1971, 13,265/71

Int. Cl. G11c *15/00*

U.S. Cl. 340—172.5 **9 Claims**

Storage space in an associative store is freely allocated between a plurality of I/O devices. Initially, each register of the store contains a number belonging to a cyclic number sequence. A number is erased when data is entered into a register and the highest (taking wrap around into account) unused number is placed in a register when data is removed. Data associated with a given device is tagged with the device address and can be stored in first-in first-out or last-in first-out

modes. In an alternative embodiment when sufficient data has been accumulated from a device, it is labelled as a data block.



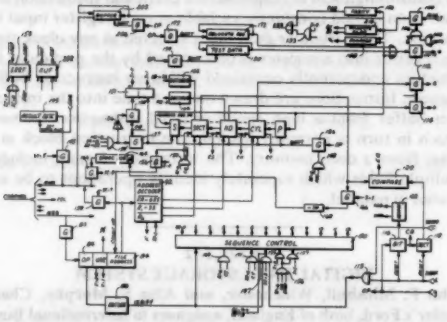
Data blocks can be transferred from the store in priority order determined either by the associated device and/or the content of the block.

3,771,143

METHOD AND APPARATUS FOR PROVIDING ALTERNATE STORAGE AREAS ON A MAGNETIC DISK PACK

Warren I. Taylor, Bradbury, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed June 1, 1972, Ser. No. 258,615
Int. Cl. G06f *11/00*
U.S. Cl. 340—172.5 **10 Claims**



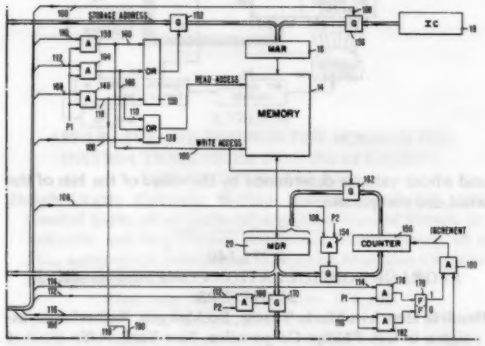
An arrangement in which a disk pack consisting of a plurality of coaxial magnetic recording disks on which spare storage sectors are provided in one portion of each track on only one disk surface. A defect in any sector of any track on any disk surface which produces a recording error results in automatically relocating the sector information on one of the spare sectors without repositioning any of the magnetic heads. The defective sector is flagged and the sector address is transferred to one of the spare sectors. In doing a Read or Write operation, when addressing a particular sector in which an error condition is flagged, the system automatically switches to the spare sector.

3,771,144

CLOCK FOR COMPUTER PERFORMANCE MEASUREMENTS

Laszlo A. Belady, Yorktown Heights; William R. De Orazio, Briarcliff Manor, and Robert W. O'Neill, South Salem, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 24, 1972, Ser. No. 274,709
Int. Cl. G06f *11/00*
U.S. Cl. 340—172.5 **6 Claims**



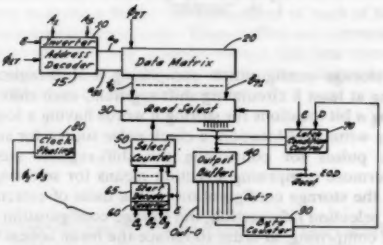
A hardware system for timing specific operations occurring in an electronic computing system. Special purpose hardware is provided in the system which may be called into operation by suitable instructions included in the program to activate certain counters, load special registers, and appropriately increment the counters as required.

3,771,145

ADDRESSING AN INTEGRATED CIRCUIT READ-ONLY MEMORY

Patricia P. Wiener, 12 Thornwood Rd., Armonk, N.Y.

Filed Feb. 1, 1971, Ser. No. 111,193
Int. Cl. G11c *17/00, 7/00*
U.S. Cl. 340—173 R **23 Claims**



A read-only memory of the MOS variety with address decoder, memory matrix and internal control for byte string extraction and sequencing. Beginning of a byte string is separately controlled, termination of extraction is redundantly established. Two chips can operate in phase opposition for doubling the overall byte string extraction rate from locations identified by a single address.

3,771,146
DATA PROCESSING SYSTEM INTERRUPT ARRANGEMENTS

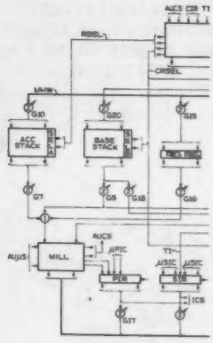
John Michael Cotton, Bournemouth; James Jeffrey Llewelyn Williams, Marlow, and David Cockburn Cosserat, London, all of England, assignors to Plessey Handel Und Investments A.G., Zug, Switzerland

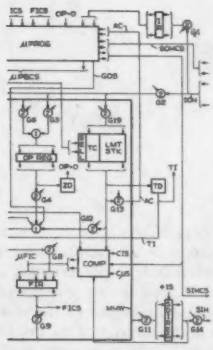
Filed Jan. 22, 1973, Ser. No. 325,707

Claims priority, application Great Britain, Jan. 26, 1972, 3,601/72

Int. Cl. G06f *11/00*; G08b *29/00*

U.S. Cl. 340—172.5 8 Claims





A data processing system includes a memory in which information is stored in segments and at least one processor unit arranged to co-operate with the memory and provided with at least one so-called capability register arranged to store a segment descriptor which includes information indicative of the base and limit addresses of a particular memory segment and is used in all memory access operations relevant to the particular memory segment and the processor unit includes a program interrupt arrangement having interrupt actuating means which when activated causes the processing of the current program to be suspended and the processing of an interrupt handling program to be commenced. The processor unit is provided with capability register restoration arrangements operative to load at least part of the capability register with a discrete characteristic code and discrete characteristic code detection means arranged to monitor the information content of each capability register as it is used and to activate the interrupt actuating means upon detection of the discrete characteristic code.

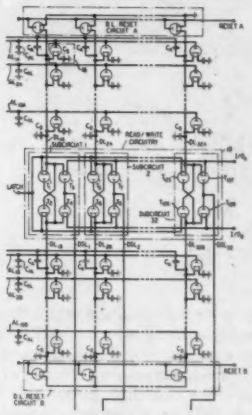
3,771,147
IGFET MEMORY SYSTEM

Harry Joseph Boll, Berkeley Heights; John Donnell Heightley, Basking Ridge, both of N.J.; James Teh-Zen Koo, Wescosville, Pa.; William Thomas Lynch, Summit, N.J.; James Thomas Nelson, Coopersburg, Pa.; Richard Sard, Westfield; Sigurd Gunther Waaben, Princeton, both of N.J., and Herbert Atkin Waggener, Allentown, Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 4, 1972, Ser. No. 312,182

Int. Cl. G11c *7/00*, *11/40*, *11/24*

U.S. Cl. 340—173 R 4 Claims



A semiconductor memory system, which utilizes a p-channel IGFET and a capacitor as the basic memory cell, contains vertical and horizontal address circuitry and input/output circuitry which permits logic information to be written in, read out and decoded. The memory is organized into two separate arrays of memory cells. Each array contains access lines and data lines. To write in or read out information from a selected cell it is first necessary to activate the appropriate access line and then lower the potential of all data lines corresponding to the array of the selected cell. The entire memory system is fabricated on a single monolithic integrated circuit chip utilizing a two level tungsten metalization process with shadow masking to form the beam leads.

3,771,148
NONVOLATILE CAPACITIVE MEMORY CELL

Nicholas E. Aneshansley, Centerville, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

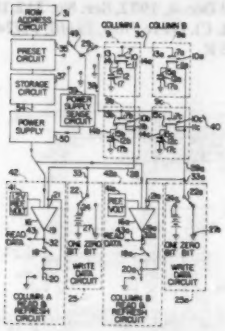
Filed Mar. 31, 1972, Ser. No. 240,259

Int. Cl. G11c *11/40*

U.S. Cl. 340—173 R 12 Claims

The present invention relates to a nonvolatile capacitive memory cell, which has a capacitive means and a nonvolatile alterable threshold field effect transistor therein. The nonvolatile alterable threshold field effect transistor is used to capacitively store information in said capacitive means while power is applied to the nonvolatile capacitive memory cell. The nonvolatile alterable threshold field effect transistor is also used to nonvolatilely store a binary bit of information which is capacitively stored within the capacitive means, when power is lost to the nonvolatile capacitive memory cell. A pulse from a storage driver connected to the gate electrode of the nonvolatile alterable threshold field effect transistor causes the nonvolatile storage of said binary bit of information. When a binary one bit of information is capacitively stored in the volatile capacitive means, and power is lost, the threshold voltage of the nonvolatile alterable threshold field

effect transistor will not be changed, representing the nonvolatile storage of a one bit by said transistor. When a binary zero bit of information is capacitively stored in the volatile capacitive means and power is lost, the threshold voltage of the nonvolatile alterable threshold field effect transistor will be changed, representing the nonvolatile storage of a zero bit by said transistor. A write data circuit is connected to the



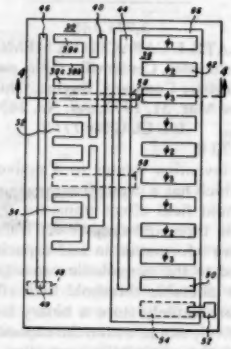
source electrode of the nonvolatile alterable threshold field effect transistor to capacitively store a binary bit of information into the capacitive means. A preset circuit and a storage circuit are used in nonvolatilely storing the one or zero bit of binary information of the capacitive means into the nonvolatile alterable threshold field effect transistor as power is lost to the nonvolatile capacitive memory cell.

3,771,149

CHARGE COUPLED OPTICAL SCANNER

Dean R. Collins, Dallas, Tex., and David L. Carter, Upper Montclair, N.J., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 30, 1971, Ser. No. 214,366
Int. Cl. H01 *11/14*; **G11c** *19/00, 11/42*
U.S. Cl. 340—173 LT **19 Claims**



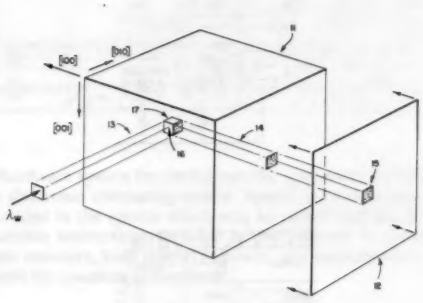
An improved optical scanner includes a semiconductor charge coupled shift register. An overflow reservoir is operably coupled to respective bits of the shift register in accordance with one aspect of the invention to receive electrical charge which is in excess of the storage capability associated with each bit to prevent "blooming." In a different aspect of the invention, an optically inactive semiconductor shift register is coupled with light sensitive regions which are adjacent respective bits of the shift register. A transfer electrode simultaneously shifts electrical data corresponding to the image from the light sensitive regions into the optically inactive shift register bits. The light sensitive elements are then ready to receive new information while the data is being clocked from the shift register. This advantageously reduces the "dead time" of the optically active regions to a minimum.

3,771,150

THREE DIMENSIONAL OPTICAL INFORMATION STORAGE SYSTEM

Irwin Schneider, 2402 Daphne Lane, Alexandria, Va.

Filed Apr. 30, 1971, Ser. No. 139,101
Int. Cl. G11c *11/42, 13/04*
U.S. Cl. 340—173 CC **14 Claims**



A system for storing information in or retrieving information from a three dimensional memory element is described. The storage principle is based upon aligning anisotropic color centers in alkali halide crystals and thereby producing dichroic absorptions which are equated to the stored information. The ability to write in the interior of the crystal is based on the fact that one can suppress the reorientation of these color centers with infrared excitation. Information states are thus established at interior regions by simply shielding those portions from the infrared excitation. Information is retrieved from the interior of the memory element by exposing it to excitation principally for the purpose of producing a transient color center absorption lying in an otherwise transparent region of the spectrum. The interrogation excitation would lie in this same spectral region.

3,771,151

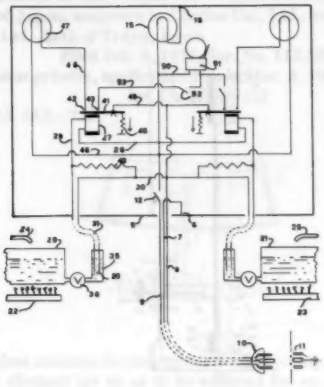
SIGNAL WARNING OF INSUFFICIENT SAP IN MAPLE SAP EVAPORATOR PAN

Lloyd H. Sipple, R.D. 2, Bainbridge; Oliver J. Hughson, 8762 Van Hoesen Rd., Clay, and Robert M. Lamb, P.O. Box 278, Liverpool, all of N.Y.

Filed Mar. 13, 1972, Ser. No. 234,262
Int. Cl. G08b *25/00*
U.S. Cl. 340—244 C **1 Claim**

If the amount of maple sap becomes too low in an evapora-

tor pan during sap evaporation for producing syrup or sugar, damage may result. The present device provides an electric



monitoring system which gives an audio alarm if the sap falls below a predetermined safe level in the pan.

3,771,152

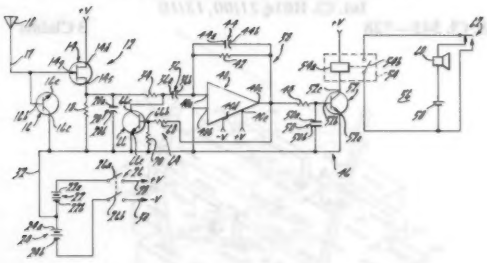
INTRUSION DETECTOR

Joseph R. Dettling, San Ramon; John F. Farnham, Jr., Concord, and Stephen T. Gaines, Pleasant Hill, all of Calif., assignor to M B Associates, San Ramon, Calif.

Filed May 25, 1972, Ser. No. 256,760

Int. Cl. G08b *13/26*

U.S. Cl. 340—258 C 30 Claims



An intrusion detector of the electrostatic field responsive type wherein changes in the surrounding electrostatic field generate signals in an antenna which is electrically coupled to a detection circuit. The detection circuit generates a detection signal in response to a preselected change in the surrounding electrostatic field indicative of an intruder's movement. Upon the generation of a detection signal, a lock-in circuit which is operatively associated with the detection circuit locks the detection circuit so that the detection signal continues to be generated irrespective to whether the intruder continues his movement. The lock-in circuit also initiates a first timing cycle, upon the completion of which the detection signal is terminated and the lock-in circuit unlocks. Upon termination of the detection signal, a second timing cycle immediately commences to begin arming the detection circuit. Upon completion of the second timing cycle, the detection circuit is again armed, or reset, so that movement of the same intruder or of a subsequent intruder can be detected. The second timing cycle is also initiated when the detector is initially switched on and affords the authorized person who has turned on the detector ample time to leave the surrounding area without generating a detection signal.

3,771,153

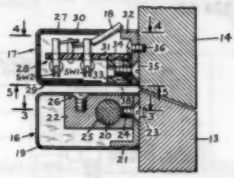
DEFEAT RESISTANT BURGLAR ALARM CONTACT

Thomas J. Byrne, New York, N.Y., assignor to American District Telegraph Company, Jersey City, N.J.

Filed Mar. 8, 1972, Ser. No. 232,871

Int. Cl. G08b *13/08*

U.S. Cl. 340—274 9 Claims



The present invention comprises a defeat resistant burglar alarm contact of miniature size for application on small safes having rotating doors as well as for the protection of other types of doors and closure elements. Special features have been provided to resist various forms of burglarious attack upon the protected closure element.

3,771,154

WARNING SYSTEM

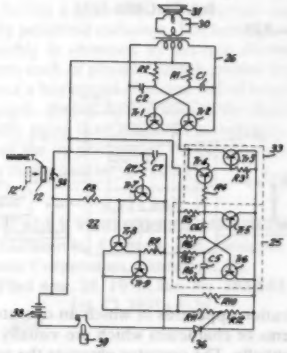
Masayoshi Takei, No. 6-5, Kita 2-chome, Kunitachishi, Tokyo, Japan

Filed Dec. 27, 1971, Ser. No. 212,063

Claims priority, application Japan, Dec. 30, 1970, 45/127552

Int. Cl. G08b *21/00*

U.S. Cl. 340—275 1 Claim



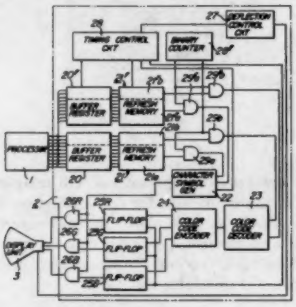
A warning system and apparatus includes a circuit for receiving a signal which is indicative of an abnormal condition and a power source for operating and maintaining a circuit to indicate the abnormal condition. A magnetic switch is used in sensing the existance of abnormal conditions. Thus, the magnetic switch serves as a sensor for detecting non-standard or alarm conditions at the site where the warning apparatus is installed.

A transistorized circuit operates to trigger the alarm and also, under certain circumstances, to delay the alarm signal during a predetermined time interval after the magnetic switch is actuated to avoid undesired indications or false alarm. Also, the system operates to maintain the alarm even after the abnormal condition which set off the alarm has returned to its normal state.

3,771,155
COLOR DISPLAY SYSTEM

Yukitaka Hayashi; Isao Yasuda, and Nagaharu Hamada, Hitachi, Japan, assignors to Hitachi, Ltd., Chiyoda-ku, Tokyo, Japan

Filed Sept. 9, 1971, Ser. No. 178,928
Claims priority, application Japan, Sept. 9, 1970, 45/78408; Feb. 22, 1971, 46/7988; Feb. 26, 1971, 46/9359
Int. Cl. G06f *3/14*
U.S. Cl. 340—324 AD **12 Claims**

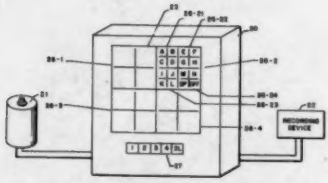


An improved color display system in which the display screen of a cathode-ray tube is divided into an appropriate number of areas each for displaying a character, symbol or picture element in two or more colors, the whole screen of the cathode-ray tube expressing a definite piece of information.

3,771,156
COMMUNICATION APPARATUS

Eugene R. V. Watts, Wilton, and Alfred J. Marcotte, Jr., Derry, both of N.H., assignors to Sanders Associates Inc., Nashua, N.H.

Filed Sept. 25, 1972, Ser. No. 292,046
Int. Cl. G08b *5/36*
U.S. Cl. 340—325 **13 Claims**



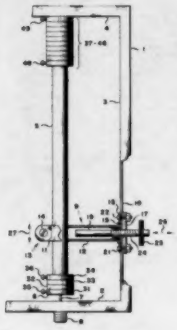
Communication apparatus in which an operator selects information items or characters which are visually displayed in groups sequentially. The operator observes the sequential display of the groups and selects the group containing the character he desires to communicate by operating a single switch mechanism in coincidence with the visual display of that group. The apparatus then sequentially displays the characters within the selected group. The operator then selects his desired character by operating the switch in coincidence with the display of that character.

3,771,157
FERRITE BROADBAND SEMI-NOTCH ANTENNA

Paul F. Stang, Saugus, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed July 3, 1972, Ser. No. 268,850
Int. Cl. H01q *1/28*
U.S. Cl. 343—708 **14 Claims**

A ferrite-loaded semi-notch antenna, especially suitable for flush mounting in the leading or trailing edge of an aerodynamic surface of an aircraft, and which is capable of functioning in both transmit and receive modes. Combines a short, folded dipole, with an active notch. The electrical length of the antenna is increased over conventional dipole

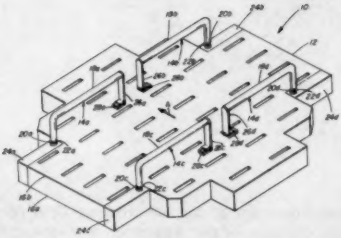


and/or notch antennas by means of end loading in the form of ferrite rings encircling the ends of the dipole. A part of the energy radiates from the conducting surface surrounding the notch, and the remaining (major) portion radiates from the elements located within the notch.

3,771,158
COMPACT MULTIFREQUENCY BAND ANTENNA STRUCTURE

Burrell R. Hatcher, Bedford, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed May 10, 1972, Ser. No. 251,953
Int. Cl. H01q *21/00, 13/10*
U.S. Cl. 343—728 **3 Claims**



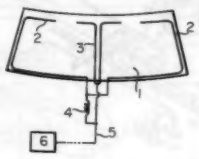
A compact multifrequency band antenna structure is disclosed. Such antenna structure is comprised of a first and second antenna section, each one thereof arranged to form an integral antenna structure. The first antenna section is a slotted waveguide planar array antenna (designed for operation in one frequency band) which serves as the ground plane for the second antenna section (the latter section being designed for operation in a second frequency band). The second antenna section is constructed such that the polarization of the radiation associated therewith is orthogonal to the polarization of the radiation associated with the slotted waveguide planar array antenna, thereby increasing the electrical isolation of the two antenna sections. In disclosed embodiments the second antenna section is formed from stripline and microstrip and the radiating front face portion of the slotted waveguide planar array antenna forms a ground plane for such stripline and microstrip.

3,771,159

WINDSHIELD ANTENNA FOR AUTOMOBILE

Suezi Kawaguchi, Warabi-shi; Kozo Miura, Kawaguchi-shi; Shigenobu Esaki, Tokyo, and Takahiro Hirase, Yokohama, all of Japan, assignors to Clarion Co., Ltd., and Asahi Glass Co. Ltd., both of Tokyo, Japan

Filed Feb. 4, 1971, Ser. No. 112,550
Claims priority, application Japan, Mar. 4, 1970, 45/20540
Int. Cl. H01q 1/32
U.S. Cl. 343—729 3 Claims



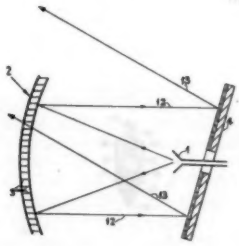
A glass antenna for automobiles which comprises a first antenna element set so as to be adapted for an FM broadcast band and a second antenna element. These antenna elements cooperate to receive an AM broadcast electric wave. The feeding points of the antenna elements are connected to each other through means for effecting reactance. The antenna elements are provided in relation to the window glass of the car.

3,771,160

RADIO AERIAL

Elizabeth Laverick, Radlett, England, assignor to Elliott Brothers (London) Limited, London, England

Filed Aug. 3, 1971, Ser. No. 168,556
Claims priority, application Great Britain, Aug. 4, 1970, 37,684/70
Int. Cl. H01q 19/00
U.S. Cl. 343—756 5 Claims



A cassegrain aerial having a primary feed, an auxiliary reflector which transmits or reflects according to the plane of polarisation of energy incident on it from the primary feed, and a main, twist reflector which receives energy reflected from the auxiliary reflector, rotates its plane through 90° and re-reflects it into free space through the intervening auxiliary reflector. The main, twist reflector consists of a sheet reflector in front of which two, parallel, wire grids are arranged, the wires extending at 45° to the plane of the incident wave and being arranged so that 90° rotation of the polarisation plane is effected at at least two frequencies.

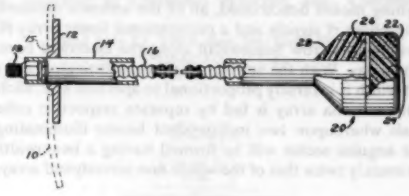
3,771,161

PRINTED-CIRCUIT FEED FOR REFLECTOR ANTENNAS

James P. Phillips, Orland Park, Ill., assignor to Andrew Corporation, Orland Park, Ill.

Filed Sept. 11, 1972, Ser. No. 287,983
Int. Cl. H01q 13/10
U.S. Cl. 343—770 7 Claims

A printed-circuit feed employs a pair of slot radiators disposed on opposite sides of an axial point at which the feed is coupled to an axially extending coaxial line. The slots are formed in a conductive coating on the forward side of a dielectric-sheet base having a feed-conductor pattern printed on the



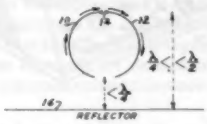
rearward side, which is backed by a foam-filled cavity. The slots are fed in opposite phase to produce in-phase electric field polarization of the radiation from the respective slots.

3,771,162

OMNIDIRECTIONAL ANTENNA

Geza Dienes, Claremont, Calif., assignor to Andrew California Corporation, Claremont, Calif.

Filed May 14, 1971, Ser. No. 143,525
Int. Cl. H01r 21/26
U.S. Cl. 343—806 4 Claims



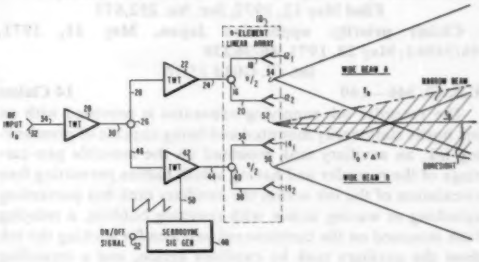
A substantially hemispherical pattern of circularly polarized radiation is obtained by quadrature-phase feeding of specially shaped dipole-and-reflector assemblies in orthogonal vertical planes, each having a generally hemispherical amplitude pattern of linearly polarized radiation. The hemispherical pattern of each assembly is obtained by arcuate downwardly bent dipole elements each of physical length greater than a quarter wavelength and a horizontal reflector rod of length exceeding a half wavelength, spaced downwardly of the dipole feed-point by substantially more than a quarter wavelength, but spaced downwardly of the tip portions of the dipole elements by substantially less than a quarter wavelength.

3,771,163

ELECTRONICALLY VARIABLE BEAMWIDTH ANTENNA

Richard E. Marinaccio, Croston, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 25, 1972, Ser. No. 283,683
Int. Cl. H01q 3/26
U.S. Cl. 343—854 10 Claims



Means for obtaining an approximate 2:1 change in beamwidth electronically in an antenna system comprised of a

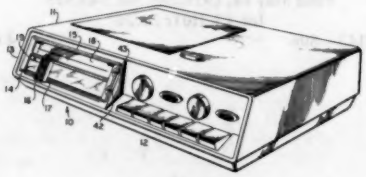
linear array of elements. Means are coupled to one of two traveling wave tubes (TWT) which feed the array for selectively serrodyning the signal fed to said one TWT, resulting in a frequency shift of the signal feeding one half of the array with respect to the signal feeding the other half. With the serrodyning means deactivated, all of the antenna elements are fed in-phase rf signals and a conventional linear array results providing a narrow beamwidth along the electrical boresight of the array. With the serrodyning means activated and since beamwidth is inversely proportional to aperture size, each half of the antenna array is fed by separate respective coherent signals whereupon two independent beams illuminating the same angular sector will be formed having a beamwidth approximately twice that of the whole non-serrodyned array.

3,771,164

APPARATUS FOR SUPPORTING AN INDEX MEMBER

Fred C. Bolick, Jr., Atlanta, Ga., assignor to Lanier Electronic Laboratory, Inc., Atlanta, Ga.

Filed Nov. 8, 1971, Ser. No. 196,556
Int. Cl. G11b *27/00;* **G01d** *15/28*
U.S. Cl. 346—134 **11 Claims**



Apparatus for supporting an index strip in a dictating-transcribing machine or the like. The apparatus provides a pair of index strip holders, with the dictating-transcribing index marker positioned to move along and over one of the holders. An index strip is placed in this one holder during dictation, and the index marker provides marks on the index strip corresponding to end-of-message or other information supplied by the dictator. When the dictation is completed the index strip is removed from the one holder and is placed in a second holder, either on the dictating machine or on a similar machine used for transcription, and the second holder is positioned to be adjacent the index marker but not to be covered or otherwise obscured by the index marker. Each of the index strip holders has a partially open front for insertion and removal of the index strips, and each of the holders includes an ejection mechanism for removing an index strip therefrom.

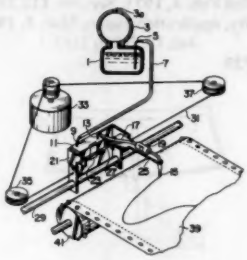
3,771,165

RECORDER INK SUPPLYING APPARATUS

Kozo Kurimoto; Sosuke Watanabe, and Hiroyasu Uchida, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 12, 1972, Ser. No. 252,671
Claims priority, application Japan, May 21, 1971, 46/34061; May 28, 1971, 46/36238
Int. Cl. G01d *15/16*
U.S. Cl. 346—140 **14 Claims**

The recorder ink supplying apparatus is provided with an ink bottle stationarily mounted and being capable of pressurizing ink, an auxiliary tank mounted on the movable pen-carriage of the recorder and having splash baffles permitting free circulation of the ink within the auxiliary tank but preventing splashing or waving action with resulting bubbles, a relaying tank mounted on the cantilevered pen arm for sucking the ink from the auxiliary tank by capillary action, and a recording pen mounted at the end of the arm cantilevered from the pen-carriage and supplied with ink from the relaying tank. Ink pressure fluctuations within the auxiliary tank on the pen-carriage caused by the deformation of the flexible hose between the ink bottle and auxiliary tank during rapid movement of the pen-carriage are compensated for by trapped air above the ink level in the auxiliary tank, to effectively form a pressurized surge tank. The relatively small capillary relaying tank provides a ready ink supply for the pen that does not materially change in weight, so that the pen pressure will not change due to ink consumption.



3,771,166

PEN TIP CONSTRUCTION FORMING SECONDARY INK RESERVOIR

Aubrey R. Tullos, P.O. Box 2373, Odessa, Tex.

Continuation-in-part of Ser. No. 222,047, Jan. 31, 1972. This application July 24, 1972, Ser. No. 274,246
Int. Cl. G01d *15/16*
U.S. Cl. 346—140 **7 Claims**

An inking pen recording system with inking pens having pen tip inserts with their upper ends shaped to cooperate within mounting chambers to form secondary ink reservoirs. The pen tips may be made of solid or fibrous material.

3,771,167

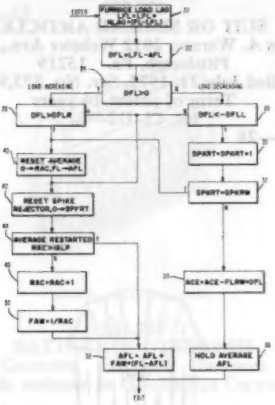
METHOD FOR CALCULATING THE AVERAGE VALUE OF A NOISE CORRUPTED SIGNAL

Charles W. Ross, Hatboro, Pa., assignor to Leeds & Northrup Company, Philadelphia, Pa.

Filed Feb. 2, 1971, Ser. No. 111,894
Int. Cl. G06f *15/56*
U.S. Cl. 444—1 **2 Claims**

A method for determining the average load provided by a steel refining furnace so that the control signal for controlling the power distribution system including the furnace load can be modified to avoid response of the control system when there is a loss of arc in the furnace. An average load is calcu-

lated for the furnace with that average being maintained until a predetermined period of time has elapsed after a sudden drop in load before the average is modified. As a result, sud-



den drops in load due to loss of arc are effectively rejected in establishing the average load value and the control signal is modified in accordance with the change in furnace load so that unwanted control is not effected in response to a loss of arc.

3,771,168

METHOD FOR APPROXIMATING WITH LINEAR SEGMENTS A CURVATURE ON A THREE-DIMENTIONAL SURFACE

Robert C. Beach, and Stanley L. Myers, both of Cincinnati, Ohio, assignors to Cincinnati Milacron, Inc., Cincinnati, Ohio

Filed July 21, 1971, Ser. No. 164,590
Int. Cl. G06f 7/38, 15/46
U.S. Cl. 444—1 **5 Claims**

A method of linear curve fitting is disclosed for use with a scanning apparatus which traces a curvature on a three-dimensional surface and produces a plurality of sample points. A computer within the apparatus is responsive to the sample points and by executing the disclosed method selects a number of said points to define linear segments along the curvature. The linear segments are defined to approximate the curvature within a predetermined tolerance.

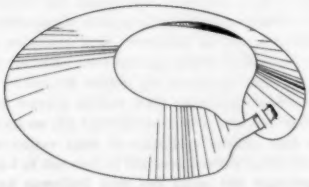
DESIGNS

NOVEMBER 6, 1973

228,977
PROTECTIVE GLOVE
Walter J. Kanicki, 2011 3rd St.,
Bay City, Mich. 48706
Filed Aug. 5, 1971, Ser. No. 169,601
Term of patent 14 years
Int. Cl. D2—*06*
U.S. Cl. D2—361

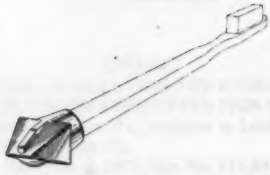
228,978
HELMET
Louis F. Werner, Saddle River, N.J., assignor to Samson Communications Corporation, Franklin Lakes, N.J.
Filed July 31, 1971, Ser. No. 176,799
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—231

228,979
HAT
Florence D. Epstein, 5101 N. 40th St.,
Phoenix, Ariz. 85018
Filed May 22, 1972, Ser. No. 255,931
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—241



228,980
SUIT OR SIMILAR ARTICLE
James A. Warner, 2012 Webster Ave., Rear,
Pittsburgh, Pa. 15219
Filed July 21, 1972, Ser. No. 273,993
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—28

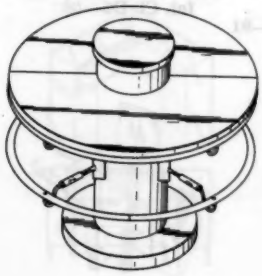
228,981
TOOTH STAIN-REMOVER TIP FOR TOOTHBRUSHES AND THE LIKE
Lewis James Halberstadt, Williamsburg, Mass., assignor to Vistron Corporation, Cleveland, Ohio
Filed Sept. 3, 1971, Ser. No. 177,915
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—24



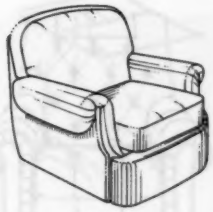
228,982
REVERSIBLE DOUBLE BRUSH
Richard Fischer, Frankfurt am Main, Germany, assignor to Coronet-Werke Heinrich Schlerf GmbH
Filed June 22, 1971, Ser. No. 155,679
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—13

228,983
BATTERY TOOTHBRUSH
Wilhelmus Gerardus Elisabeth Janssens, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Feb. 22, 1972, Ser. No. 228,432
Claims priority, application Netherlands Aug. 30, 1971
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—15

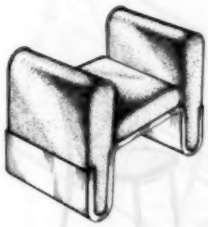
228,984
FIXTURE FOR DISPLAYING MERCHANDISE
Anthony S. Miller, Jr., Vincentown, N.J., assignor to Col-O-Rac, Inc., Cherry Hill, N.J.
Original design application Oct. 16, 1970, Ser. No. 25,534, now Patent No. 225,703. Divided and this application Mar. 3, 1972, Ser. No. 231,795
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—28



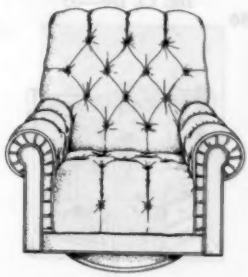
228,985
LOUNGE CHAIR
Thomas Winrow, Naperville, Ill., assignor to Mohasco Industries, Inc., Amsterdam, N.Y.
Filed June 1, 1971, Ser. No. 149,112
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—39



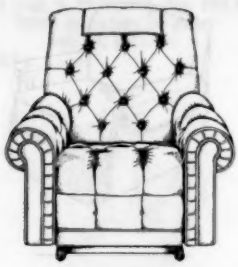
228,986
BENCH
Farid A. Iskander, Brooklyn, N.Y., assignor to Herman Miller, Inc., Zeeland, Mich.
Original design application July 9, 1969, Ser. No. 18,126, now Patent No. 222,052. Divided and this application June 23, 1970, Ser. No. 23,630
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—58



228,987
CHAIR
Stapleton Long, Morristown, Tenn., assignor to The Berkline Corporation, West Springfield, Mass.
Filed Mar. 2, 1972, Ser. No. 231,457
Term of patent 3½ years
Int. Cl. D6—*01*
U.S. Cl. D6—71



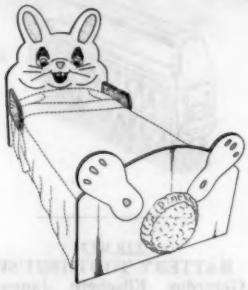
228,988
CHAIR
Stapleton Long, Morristown, Tenn., assignor to The Berkline Corporation, West Springfield, Mass.
Filed Mar. 2, 1972, Ser. No. 231,458
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—71



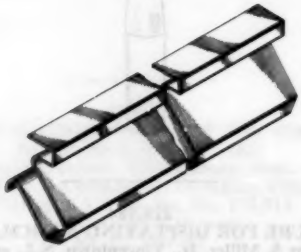
228,989
CHAIR
Dillon Charles Furey, Kirribilli, New South Wales, Australia, assignor to Sebel Limited, Bankstown, New South Wales, Australia Manufacturers
Filed Apr. 5, 1971, Ser. No. 131,561
Claims priority, application Australia Aug. 7, 1970
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—78

228,990
COMBINED DESK, LOCKER AND BUNK BED UNIT
Kenneth F. Villanova, Providence, R.I., assignor of a fractional part interest to David R. Villanova, Chepachet, R.I.
Filed Dec. 4, 1972, Ser. No. 311,744
Term of patent 14 years
Int. Cl. D6—*05*
U.S. Cl. D6—80

228,991
BED
Margaret Ross Hinton, Box 572, Mount Pleasant, Tex. 75455
Filed May 4, 1972, Ser. No. 250,471
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—83

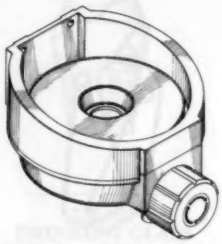


228,992
CLOTHES HANGER BAR FOR ATTACHMENT TO A SHELF EDGE
Joe B. Ramsey, Walnut, Calif., assignor to Acme General Corporation, Monrovia, Calif.
Filed Dec. 21, 1970, Ser. No. 26,585
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—85

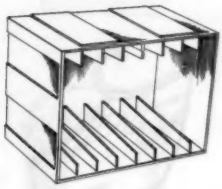


228,993
SHAVING EQUIPMENT HOLDER
William E. Jackson, 3933 Jan Ave., Tyler, Tex. 75701
Filed May 1, 1972, Ser. No. 249,486
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—91

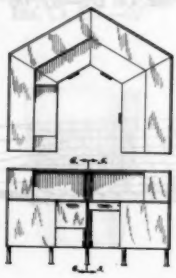
228,994
COMBINED DISPENSING BASE AND MOUNTING BRACKET
Jean O. Reinecke, Pasadena, and Richard C. Speak, Fullerton, Calif., assignors to United States Borax & Chemical Corporation, Los Angeles, Calif.
Filed Apr. 6, 1972, Ser. No. 241,889
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—95



228,995
STORAGE CABINET
Edsel Legresley, Scarborough, Ontario, Canada, assignor to Integrated Plastics Limited, Scarborough, Ontario, Canada
Filed Sept. 24, 1971, Ser. No. 183,731
Claims priority, application Canada Apr. 21, 1971
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—127

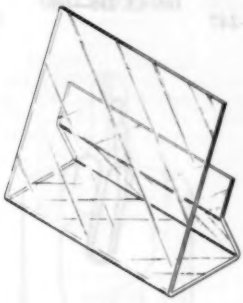


228,996
MODULAR DESK
George M. Morris, 3900 Circle Drive, Independence, Mo. 64052
Filed Jan. 10, 1972, Ser. No. 216,911
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—159



228,997
DISPLAY RACK FOR SHOES
Michael Wahl, Searington, N.Y., assignor to Wahl Associates, Inc., Long Island City, N.Y.
Filed Apr. 19, 1972, Ser. No. 245,704
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—181

228,998
COOKBOOK RACK
Barry M. Rozman, Jamaica, N.Y. (130 E. 18th St., New York, N.Y. 10003)
Filed Aug. 11, 1971, Ser. No. 171,029
Term of patent 3½ years
Int. Cl. D6—*99*
U.S. Cl. D6—184

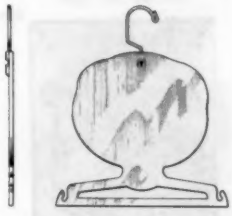


228,999
DECORATIVE PANEL
Herbert P. Lee, Brodbecks, Pa., assignor to Wilton/Lee, Ltd., Columbia, Pa.
Filed Aug. 17, 1971, Ser. No. 172,613
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—192

229,000
BATHMAT
Robert O'Neil and Michael C. Wilson, Wheaton, Ill., assignors to Pretty Products, Inc., Coshocton, Ohio
Filed Sept. 10, 1971, Ser. No. 179,614
Term of patent 14 years
Int. Cl. D6—*11*
U.S. Cl. D6—209

229,001
DISPLAY HANGER FOR SHOES
Michael Wahl, Searington, N.Y., assignor to Wahl Associates, Inc., Long Island City, N.Y.
Filed Apr. 19, 1972, Ser. No. 245,705
Term of patent 14 years
Int. Cl. D6—*08*
U.S. Cl. D6—247

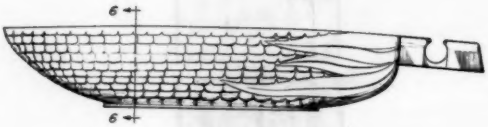
229,002
CLOTHES HANGER
Arthur J. Brannon, Fort Worth, Tex., assignor to Kids Stuff Creations, Fort Worth, Tex.
Filed Sept. 25, 1972, Ser. No. 291,555
Term of patent 14 years
Int. Cl. D6—*08*
U.S. Cl. D6—248



229,003
DISPLAY HANGER FOR SHOES
Michael Wahl, Searington, N.Y., assignor to Wahl Associates, Inc., Long Island City, N.Y.
Filed Mar. 28, 1972, Ser. No. 239,001
Term of patent 14 years
Int. Cl. D6—*08*
U.S. Cl. D6—252

229,004
HANGER
Aldo Louis Biondi, Huntington, and Michael Avrum Kaufman, Melville, N.Y., and Warren Alvin Vierow, Lebanon, and Martin Weisman, Closter, N.J., assignors to International Playtex Corporation, New York, N.Y.
Filed May 15, 1972, Ser. No. 253,706
Term of patent 14 years
Int. Cl. D6—*08*
U.S. Cl. D6—254

229,005
CORN DISH
Franklin S. Davis, 17 Hillview Road, North Reading, Mass. 01867
Filed Feb. 18, 1972, Ser. No. 227,698
Term of patent 14 years
Int. Cl. D7—*01, 06*
U.S. Cl. D7—5

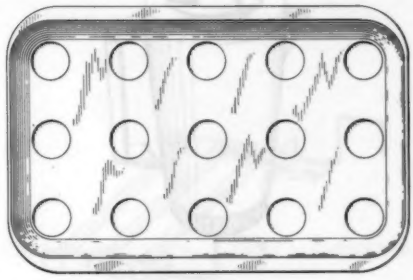


229,006
INSULATED TUMBLER OR THE LIKE
Lawrence K. Sauey, Baraboo, Kenneth M. Douglas, Sun Prairie, and Gerald A. Rau, Baraboo, Wis., assignors to Flambeau Plastics Corporation, Baraboo, Wis.
Filed Oct. 13, 1971, Ser. No. 189,072
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—6

229,007
DRINKING GLASS
Frederick R. Hodges, 520 N. Michigan Ave., Chicago, Ill. 60611
Filed Oct. 26, 1970, Ser. No. 25,639
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—14

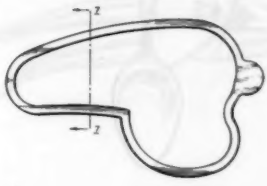
229,008
TUMBLER
Robert F. Bateman, St. Paul, Minn., assignor to Plastics, Inc., St. Paul, Minn.
Filed Apr. 27, 1972, Ser. No. 248,342
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—14

229,009
TRAY
John T. Dolby, Winnetka, and James S. Adler, Chicago, Ill., assignors to Standard Oil Company, Chicago, Ill.
Filed Dec. 14, 1970, Ser. No. 26,477
Term of patent 14 years
The portion of the term of the patent subsequent to Jan. 19, 1987, has been disclaimed
Int. Cl. D7—*01*
U.S. Cl. D7—38



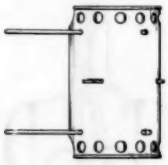
229,010
MOLD FOR CHOPPED MEAT PRODUCT
Paul F. Ruhan, Eben St., Milford, Mass. 01757
Filed Feb. 3, 1972, Ser. No. 223,410
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—43

229,011
MOLD FOR CHOPPED MEAT PRODUCT
Paul F. Ruhan, Eben St., Milford, Mass. 01757
Filed Feb. 3, 1972, Ser. No. 223,412
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—43



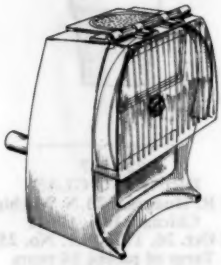
229,012
COVERED PITCHER
Dwight N. Wooters, Wooster, Ohio, assignor to Rubbermaid Sales Corp., Wooster, Ohio
Filed July 31, 1972, Ser. No. 276,830
Term of patent 7 years
Int. Cl. D7—*01*
U.S. Cl. D7—65

229,013
CHARCOAL FIRE STARTER AND GRILL
Duane L. Storandt, 12 Hanley Downs, St. Louis, Mo. 63117
Filed Aug. 28, 1972, Ser. No. 284,239
Term of patent 14 years
Int. Cl. D7—*02;* D26—*99*
U.S. Cl. D7—107



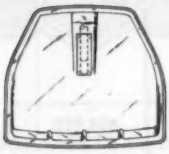
229,014
SPOON OR SIMILAR ARTICLE
Melvin A. Lea, Oneida, N.Y., assignor to General Mills, Inc.
Filed Nov. 19, 1971, Ser. No. 200,644
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137

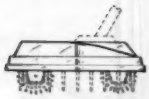
229,015
FOOD CUTTING MACHINE
Raymond Kieves, Winnipeg, Manitoba, Canada, assignor to K-Tel International, Inc., Minneapolis, Minn.
Filed Oct. 4, 1971, Ser. No. 186,567
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—155



229,016
HAND-HELD CLOTHES STEAMER
Emil Robert Plasko, Dayton, Ohio, assignor to Micro Devices Corp., Dayton, Ohio
Filed Aug. 30, 1971, Ser. No. 176,439
Term of patent 14 years
Int. Cl. D7—*05;* D15—*05*
U.S. Cl. D7—161

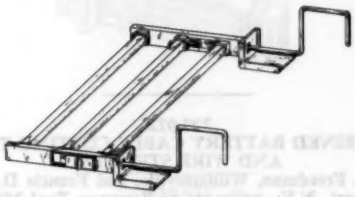
229,017
HOUSING FOR RAKE FOR FLUFFING CARPETS
Louis E. Kopecky, 4th and Downing Sts., Hollister, Mo. 65672
Filed Sept. 24, 1971, Ser. No. 183,747
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—177





229,018
BAG HOLDER
William E. Howard, West Hartford, Conn., assignor to Asta-Werke Aktiengesellschaft, Chemische Fabrik of Brackwede, Westfalen, Germany
Filed Feb. 10, 1972, Ser. No. 225,373
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—193

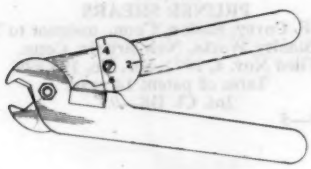
229,019
CLOTHES DRYER
Erich Slany, Esslingen-Zell, Germany, assignor to Leifheit International Gunter Leifheit KG, Nassau, Lahn, Germany
Filed Nov. 19, 1971, Ser. No. 200,658
Claims priority, application Germany May 26, 1971
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—196



229,020
PRUNER SHEARS
Laird F. Covey, Easton, Conn., assignor to The Stanley Works, New Britain, Conn.
Filed Nov. 4, 1971, Ser. No. 195,899
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—5

229,021
COMBINED BOTTLE OPENER AND CAN PIERCER
Vivian M. Brandow, 7828 SE. Johnson Creek Blvd., Portland, Oreg. 97206
Filed June 29, 1972, Ser. No. 267,691
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D8—18

229,022
COMBINED BATTERY CABLE CUTTING TOOL AND WIRE STRIPPER
Alan L. Freedman, Williamsville, and Francis D. Allen, Amherst, N.Y., assignors to Bergman Tool Mfg. Co., Inc., Buffalo, N.Y.
Filed Aug. 13, 1971, Ser. No. 171,801
Term of patent 7 years
Int. Cl. D8—*05*
U.S. Cl. D8—52



229,023
ELECTRIC SCISSORS
E. Georgio Laurenti, New York, N.Y., assignor to Lindar Mfg. Corp., New York, N.Y.
Filed Sept. 16, 1971, Ser. No. 181,287
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—61

229,024
DOOR HANDLE, LOCK HOUSING AND PLATE ENSEMBLE
William J. Horgan, Jr., Pittsburgh, Pa., assignor to Blumcraft of Pittsburgh, Pittsburgh, Pa.
Continuation-in-part of applications Ser. No. 21,816, Mar. 9, 1970 and Ser. No. 23,254, June 1, 1970. This application May 24, 1971, Ser. No. 146,590
Term of patent 14 years
Int. Cl. D—*06*
U.S. Cl. D8—138

229,025
DECORATIVE FASTENER FOR DRAPERY HARDWARE OR THE LIKE
Irving Levine, 9171 Gazette Ave., Chatsworth, Calif. 91311
Filed Aug. 16, 1971, Ser. No. 172,364
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—145

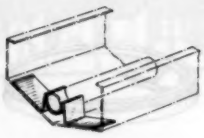
229,026
COMBINED HANDLE AND MOUNTING MEMBER
Simon Javkin, 160 West End Ave., New York, N.Y. 10023
Filed Sept. 30, 1971, Ser. No. 185,488
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D8—154

229,027
PULL
LaVerne E. Clayton, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.
Original design application Aug. 12, 1970, Ser. No. 24,455, now Patent No. 222,233, dated Oct. 12, 1971. Divided and this application Mar. 25, 1971, Ser. No. 128,225
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—166

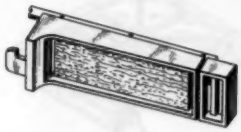
229,028
DOOR SAFETY CATCH
Frank Mestre, R.D. 1, Box 108, Rhinebeck, N.Y. 12572
Filed Aug. 21, 1972, Ser. No. 282,594
Term of patent 7 years
Int. Cl. D8—*07*
U.S. Cl. D8—203

229,029
CASTOR
Michael James Fisher, 16 Portland Crescent, Pedmore, Worcestershire, England
Filed Apr. 5, 1972, Ser. No. 241,489
Claims priority, application Great Britain Jan. 29, 1972
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D8—226

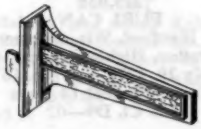
229,030
POULTRY FEEDER PIPE SUPPORT
Gerald L. Kitson, 9709 Belding Road, Rockford, Mich. 49341
Filed July 6, 1971, Ser. No. 160,245
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—235



229,031
SHELF BRACKET
Irwin J. Ferdinand, Glencoe, and Irwin R. Kulbersh, Morton Grove, Ill., assignors to The Hirsh Company, Skokie, Ill.
Filed Mar. 2, 1972, Ser. No. 231,445
Term of patent 14 years
Int. Cl. D8—*08, 09*
U.S. Cl. D8—242

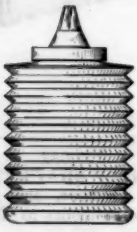


229,032
SHELF BRACKET
Irwin J. Ferdinand, Glencoe, and Irwin R. Kulbersh, Morton Grove, Ill., assignors to The Hirsh Company, Skokie, Ill.
Filed Mar. 2, 1972, Ser. No. 231,446
Term of patent 14 years
Int. Cl. D8—*08, 09*
U.S. Cl. D8—242

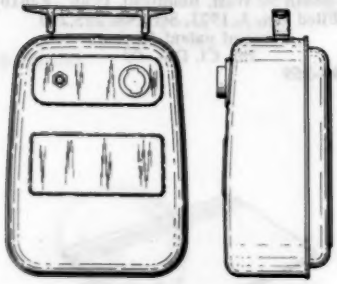


229,033
UTILITY CLIP
F. Wayne Cooper, Anaheim, Calif. (1749 South 50 West, Bountiful, Utah 84010)
Filed Jan. 3, 1972, Ser. No. 215,280
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—259

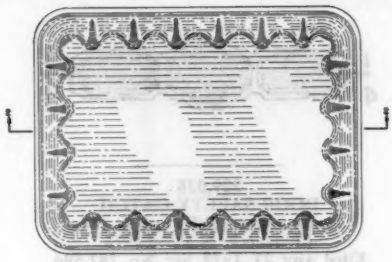
229,034
DISPENSING CONTAINER
Kenneth Michael Miller, Yorktown Heights, and Roy Watson, Mount Kisco, N.Y., Rennold Lodge Klawson, Darien, Conn., and Raymond Joseph Russell, Pearl River, N.Y., assignors to General Foods Corporation, White Plains, N.Y.
Filed Mar. 31, 1972, Ser. No. 222,444
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—2



229,035
FUEL CAN
Paul F. Quick, Hartford, Wis., assignor to Chrysler Corporation, Highland Park, Mich.
Filed July 29, 1971, Ser. No. 167,545
Term of patent 14 years
Int. Cl. D9—*02*
U.S. Cl. D9—175



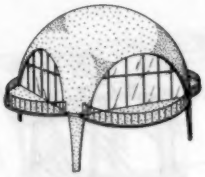
229,036
PACKAGING TRAY FOR MEAT OR THE LIKE
Paul Joonase, Taylors, S.C., assignor to W. R. Grace & Co., Duncan, S.C.
Filed May 22, 1972, Ser. No. 255,954
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—219



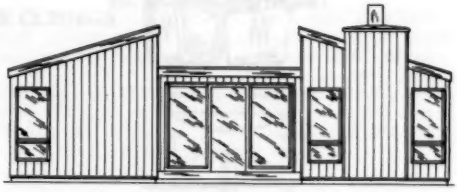
229,037
PACKAGING BOX
Takaji Funahashi, 1, 2-chome, Kitatakascho-machi, Nishi-ku, Nagoya-shi, Aichi-ken, Japan
Filed July 23, 1971, Ser. No. 165,868
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—223

229,038
NON-SPILL CONTAINER LID
Frank C. Schutz, 8547 Cherokee Drive, Downey, Calif. 90241
Filed Oct. 10, 1972, Ser. No. 295,977
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—257

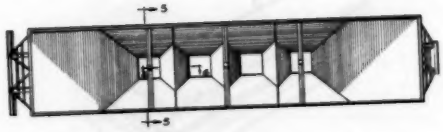
229,039
MODULAR STRUCTURE
George G. Rangel, 136 Trillium, and Robert T. Harper, Jr., 243 Future Drive, both of San Antonio, Tex. 78213
Filed Mar. 29, 1971, Ser. No. 129,278
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 E



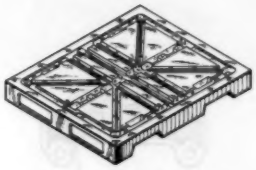
229,040
MODULAR HOUSE
Edward M. Coplon, New York, N.Y., assignor to Hodgson Houses, Inc., New York, N.Y.
Filed Feb. 22, 1972, Ser. No. 228,443
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 A

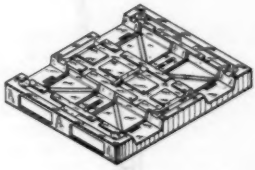


229,041
HOPPER SEMI-TRAILER
Morrison Kai Norton, 1202 E. Kentucky Ave., Woodland, Calif. 95695
Filed July 29, 1971, Ser. No. 167,549
Term of patent 14 years
Int. Cl. D12—*10*
U.S. Cl. D14—3 E

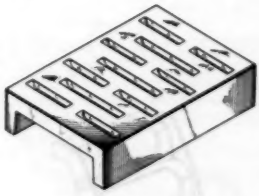


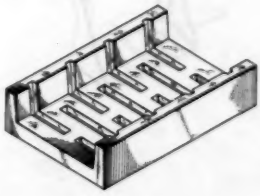
229,042
PALLET
Dennis M. Melnick and Mark Kubick, Baden, Pa., assignors to Pallet Development Inc., Ambridge, Pa.
Filer Sept. 29, 1971, Ser. No. 184,988
Term of patent 14 years
Int. Cl. D12—*99*
U.S. Cl. D14—3 N



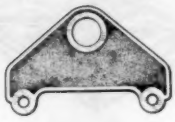


229,043
PALLET
Dennis M. Melnick and Mark Kubick, Baden, Pa., assignors to Pallet Development Inc., Ambridge, Pa.
Filed Aug. 24, 1972, Ser. No. 283,589
Term of patent 14 years
Int. Cl. D12—*99*
U.S. Cl. D14—3 N



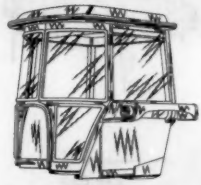


229,044
INSTRUMENT AND ACCESSORY PANEL FOR VEHICLES
Paul E. Freiling, 1006 Maertin, Fullerton, Calif. 92631, and Joseph E. Smith, 606 Clarion Place, Claremont, Calif. 91711
Filed Oct. 4, 1972, Ser. No. 298,799
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D14—6 P

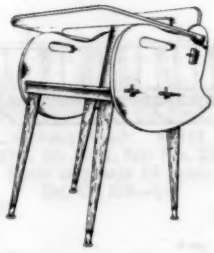


229,045
STEP FOR A MOTOR VEHICLE
Carl Woodall, Downey, Calif., assignor to James Carl Woodall, Los Angeles, Calif.
Filed Aug. 16, 1971, Ser. No. 172,379
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D14—13

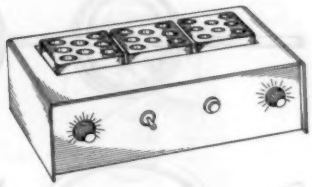
229,046
TRACTOR CAB
William F. H. Purcell, New York, James M. Conner, Mamaroneck, and Charles W. Pelly, Scarsdale, N.Y., assignors to Deere & Company, Moline, Ill.
Filed Mar. 22, 1972, Ser. No. 237,226
Term of patent 14 years
Int. Cl. D12—*09*
U.S. Cl. D14—27 B



229,047
HIGH CHAIR
Earl E. Lockwood, 35 Crosby St., East Hartford, Conn. 06118
Filed Jan. 15, 1971, Ser. No. 106,943
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D15—1

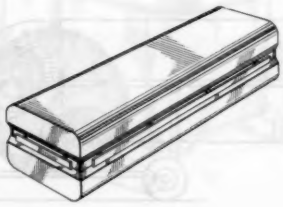


229,048
MULTI-BLOCK-TYPE TEST TUBE HEATER
Alexander I. Newman, River Forest, Ill., assignor to Lab-Line Instruments, Inc., Melrose Park, Ill.
Filed June 1, 1972, Ser. No. 258,933
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D16—2 C



229,049
EASY BREAK TABLET
Edwin F. Roberts, Stamford, Conn., assignor to Ives Laboratories, Inc., New York, N.Y.
Continuation of abandoned design applications Ser. No. 185,460 and Ser. No. 185,467, both Sept. 30, 1971. This application Oct. 10, 1972, Ser. No. 296,386
Term of patent 14 years
Int. Cl. D28—*01;* D1—*01*
U.S. Cl. D16—3

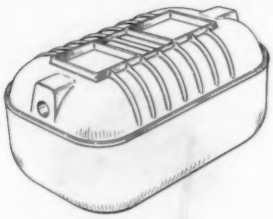
229,050
CASKET
Edward R. Andrus, Jr., Mount Prospect, Dale E. Fahnstrom, Riverside, and James G. Hansen, La Grange, Ill., assignors to Elder Wilbert Corp., Broadview, Ill.
Filed Mar. 20, 1972, Ser. No. 236,537
Term of patent 14 years
Int. Cl. D31
U.S. Cl. D19—1



229,051
DUAL PURPOSE GAFF AND FISHHOOK DISLODGER
Franklin D. J. Bordenave, 7725 Devine Ave., New Orleans, La. 70127
Filed Aug. 30, 1972, Ser. No. 284,973
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—22

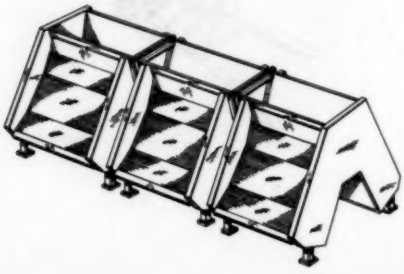
229,052
FISH SKINNING PLIERS
Reaser H. Courtney, Rte. 5, Nampa, Idaho 83651
Filed July 28, 1971, Ser. No. 167,066
Term of patent 14 years
Int. Cl. D8—*05;* D22—*05*
U.S. Cl. D22—31

229,053
SEPTIC TANK
Paul Le Blanc, 160 Vero Beach Blvd., Weston, Ontario, Canada
Filed Feb. 11, 1972, Ser. No. 225,689
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—2

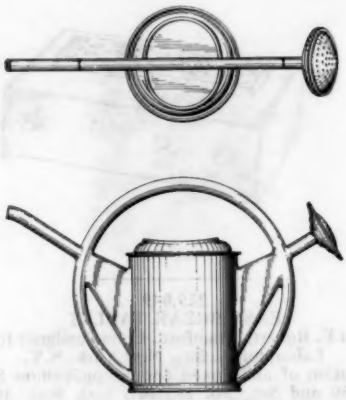


229,054
COMBINED FILTER AND WATER TREATMENT UNIT OR THE LIKE
Kouichi Watanabe, Toyonaka, Japan, assignor to Kurita Water Industries Ltd., Osaka, Japan
Filed Sept. 28, 1971, Ser. No. 184,652
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—3

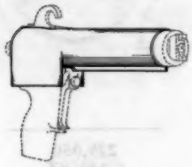
229,055
DEWATERING, SEPARATING AND CLASSIFYING APPARATUS
Marvin E. Ginaven, Springfield, Ohio, assignor to The Bauer Bros. Co., Springfield, Ohio
Filed Sept. 23, 1971, Ser. No. 183,305
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—4



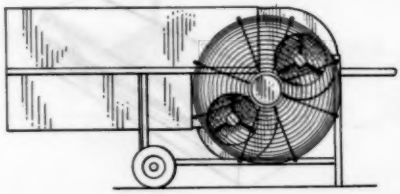
229,056
SPRINKLING CAN
Edward C. Grotz, 1505 Harvey Road, Wilmington, Del. 19810
Filed Aug. 11, 1971, Ser. No. 171,026
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—11



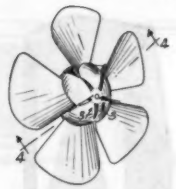
229,057
SHEATH FOR A SPRAY COATING APPARATUS
James A. Scharfenberger and John R. Snyder, Indianapolis, Ind., assignors to Ransburg Electro-Coating Corp., Indianapolis, Ind.
Original design application Dec. 9, 1970, Ser. No. 26,377, now Patent No. 225,107, dated Nov. 14, 1972. Divided and this application June 7, 1972, Ser. No. 260,704
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—36



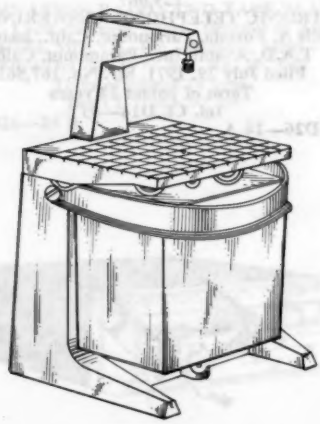
229,058
SPACE HEATER
Erhard E. Alms, Barrington, and James E. Mitchell, Cary, Ill., assignors to AFE Industries, Inc., Lake Zurich, Ill.
Filed Nov. 8, 1971, Ser. No. 196,871
Term of patent 3½ years
Int. Cl. D23—*03*
U.S. Cl. D23—91



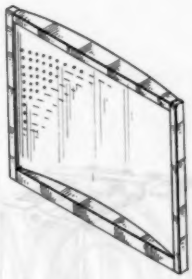
229,059
MOLDED FAN
James A. Swimmer, Highland Park, Ill., assignor to Air King Corporation
Filed Apr. 5, 1972, Ser. No. 241,494
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—165



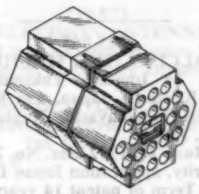
229,060
DRILLING MACHINE FOR DENTAL MODELS
Bernard Weissman, 236 5th Ave., New York, N.Y. 10001
Filed Sept. 11, 1972, Ser. No. 287,856
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—1 B



229,061
COMBINED PEGBOARD AND BLACKBOARD
Lynn Pressman, 200 5th Ave., New York, N.Y. 10010
Filed Dec. 17, 1971, Ser. No. 209,488
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D25—1 R

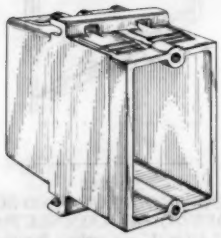


229,062
COMBINATION PLUG AND SOCKET POLYGONAL CONNECTOR
Friedrich Josef Alois Kourimsky, Bensheim, Germany, assignor to AMP Incorporated, Harrisburg, Pa.
Filed Sept. 8, 1971, Ser. No. 178,585
Claims priority, application Germany Apr. 22, 1971
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 A

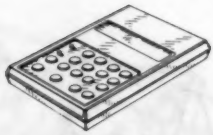


229,063
COMBINED DATA KEYBOARD ENTRY AND DISPLAY CONSOLE
Clarence D. Zierhut and Gene D. Vedder, Granada Hills, Calif., assignors to Lexitron Corporation, Burburbank, Calif.
Filed July 19, 1971, Ser. No. 164,201
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C

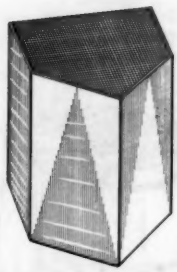
229,064
MOLDED BOX FOR ELECTRIC SWITCHES
James C. Powell, Elkhart, Ind., assignor to All-Steel Equipment Inc.
Filed Nov. 15, 1971, Ser. No. 199,091
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—5 B



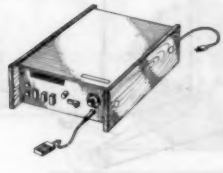
229,065
CALCULATING MACHINE
Hisashi Maeda, 24 Imazato Yakushido, Nagaokacho, Otokuni-gun, Kyoto-fu, Japan, and Kenichi Kitazima, 18–45 Imazato, Hikobayashi, Nagaokacho, Otokuni-gun, Kyoto-fu, Japan
Filed June 20, 1972, Ser. No. 264,571
Claims priority, application Japan Dec. 21, 1971
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



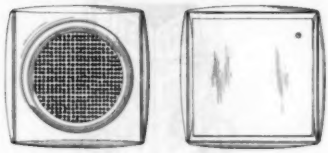
229,066
LOUDSPEAKER
Hans Ingvar Ekdahl, Staffanstorp, and Sten Egon Oskar Olofsson, Malmo, Sweden, assignors to Handelsbolaget Under Firma Handels-Och Konsultfirman Ekdahl & Olofsson
Filed July 20, 1971, Ser. No. 164,494
Claims priority, application Sweden Jan. 21, 1971
Term of patent 14 years
Int. Cl. D26—*01*
U.S. Cl. D26—14 G



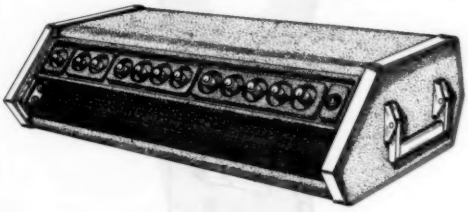
229,067
ELECTRONIC TELEPHONE ANSWERING UNIT
Francis A. Foresta, Paramount, Calif., assignor to T.A.D. Avanti, Inc., Paramount, Calif.
Filed July 29, 1971, Ser. No. 167,561
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 A



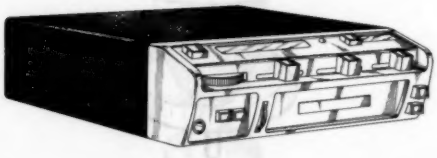
229,068
STEREO SPEAKER
Dennis L. Engle, 9651 Angleridge, Dallas, Tex. 75238
Filed July 9, 1971, Ser. No. 161,431
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 G



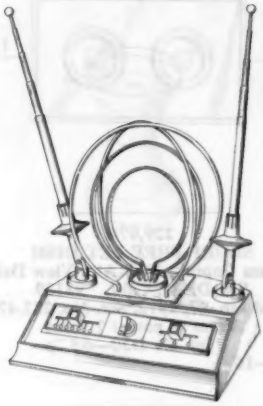
229,069
AMPLIFIER APPARATUS
Wesley W. Dewey, Chanute, Kans., assignor to Kustom Electronics, Inc., Chanute, Kans.
Filed July 17, 1972, Ser. No. 272,313
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 L



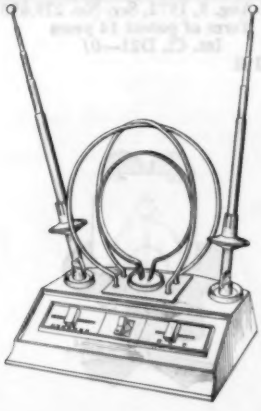
229,070
COMBINATION RADIO AND TAPE PLAYER
George E. Lyall, Melrose, Mass., assignor to Automatic Radio Mfg. Co., Inc., Melrose, Mass.
Filed Oct. 12, 1972, Ser. No. 297,053
Term of patent 14 years
Int. Cl. D14—*01, 03*
U.S. Cl. D26—14 B



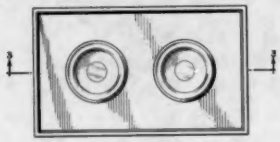
229,071
TELEVISION ANTENNA
Harvey R. Brandt and Nicholas Werner, Somerville, N.J., assignors to Gavin Electronics Division, Antennacraft Company
Filed Dec. 29, 1972, Ser. No. 319,505
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 F



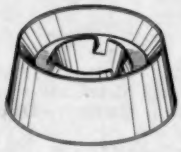
229,072
TELEVISION ANTENNA
Harvey R. Brandt and Nicholas Werner, Somerville, N.J., assignors to Gavin Electronics Division, Antennacraft Company
Filed Dec. 29, 1972, Ser. No. 319,506
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 F



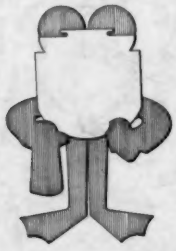
229,073
COMBINED TRAY AND PET FOOD BOWLS OR SIMILAR ARTICLE
Robert W. Brickel, 483 Sharon Drive, Rochester, N.Y. 14626
Filed Jan. 10, 1972, Ser. No. 216,915
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—16



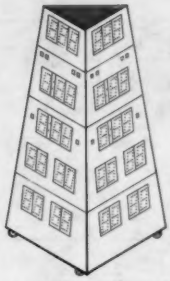
229,074
SLURP-FREE PET DISH
Thomas Cuprak, 2038 Alta View Drive, San Diego, Calif. 92139
Filed Jan. 27, 1972, Ser. No. 221,479
Term of patent 7 years
Int. Cl. D30—*03*
U.S. Cl. D30—16



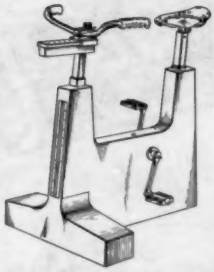
229,075
PUPPET
Christopher S. Crowell, Darien, Conn. (242 Main St., Southport, Conn. 06494)
Filed Aug. 9, 1972, Ser. No. 279,093
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—2 R



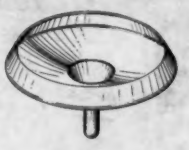
229,076
MATSIDE WRESTLING SCOREBOARDS
Aelred J. Kurtenbach, Brookings, S. Dak., and Dennis J. Holm, Reston, Va., assignors to Daktronics, Inc., Brookings, S. Dak.
Filed July 28, 1971, Ser. No. 167,082
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 MM



229,077
COMBINED BICYCLE FITTER AND EXERCISER
Albert V. Scalingi, Winchester, and Allen R. Williams, Jr., Lynnfield, Mass., assignors to Raleigh Industries Limited, Nottingham, England
Filed Jan. 31, 1972, Ser. No. 222,426
Term of patent 7 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 K

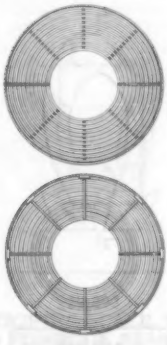


229,078
BALL WHIRLING TOY
Harold Aster, 788 Sacco Place, North Bellmore, N.Y. 11710
Filed Aug. 31, 1971, Ser. No. 176,778
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 K



229,079
CHILD'S RIDING VEHICLE
Robert E. Boyle, P.O. Box 7225,
St. Petersburg, Fla. 33734
Filed Mar. 17, 1972, Ser. No. 235,871
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ

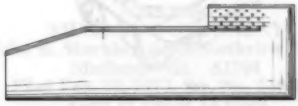
229,080
TREE GRATE
John M. Mihm, 515 Edgerton Place,
Pittsburgh, Pa. 15208
Filed Apr. 21, 1972, Ser. No. 246,520
Term of patent 14 years
Int. Cl. D31
U.S. Cl. D35—1



229,081
PLANTER OR SIMILAR ARTICLE
Arnold C. Martinelli, Lake Shore Drive,
Rawdon, Quebec, Canada
Filed June 15, 1972, Ser. No. 263,135
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D35—3 A

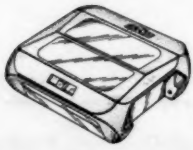
229,082
PLANTER
Arnold C. Martinelli, Lake Shore Drive,
Rawdon, Quebec, Canada
Filed June 15, 1972, Ser. No. 263,138
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D35—3 A

229,083
DISPOSABLE GRASS CATCHER BAG
Victor Leader, Rte. 1, Box 56D, Cedar, Minn. 55011
Filed June 30, 1971, Ser. No. 158,653
Term of patent 14 years
Int. Cl. D15—*03, 99*
U.S. Cl. D40—1 A



229,084
COMBINED CLOCKFACE AND HANDS
Dominick A. Giordano, Philadelphia, Pa., assignor of a fractional part interest to The Raymond Lee Organization, New York, N.Y.
Filed July 19, 1971, Ser. No. 164,187
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D42—1 B

229,085
WRISTWATCH
Donald J. Lutenegger, Dayton, Ohio, assignor to Riehl Electronics Corporation, Troy, Ohio
Filed Apr. 20, 1972, Ser. No. 246,122
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D42—8 R



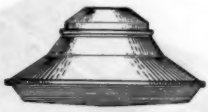
229,086
RING
Janett N. Bellamy, 821 NE. 28th St., Grand Prairie, Tex. 75050
Filed Sept. 29, 1972, Ser. No. 293,468
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—10 A

229,087
FINGER RING
Frank P. Ciambra, 772 Stewart St., and Herman Noriega, 760 Stewart St., both of Ridgefield, N.J. 07657
Filed Sept. 29, 1972, Ser. No. 297,399
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—10 C

229,088
PENDANT
Harold Antoine, Jr., 8449 Fresno Court, Cool Valley, Mo. 63121
Filed Oct. 16, 1972, Ser. No. 298,437
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—15

229,089
FLASHLIGHT
Guy Boucher, Romainville, France, assignor to Societe des Accumulateurs Fixes et de Traction, Romainville, France
Filed Aug. 15, 1972, Ser. No. 280,819
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—24 A

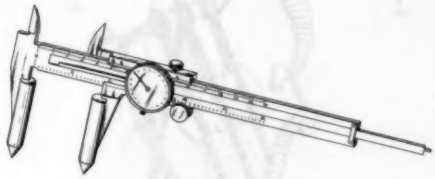
229,090
LUMINAIRE
Eldon L. Anderson, Jr., Fletcher, N.C., assignor to General Electric Company
Original design application June 1, 1970, Ser. No. 23,218, now Patent No. 222,103. Divided and this application Apr. 13, 1971, Ser. No. 133,777
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—23 R



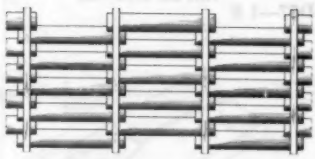
229,091
CASING FOR A CIGARETTE LIGHTER
Frank H. Stephens, Jr., Dunwoody, Ga., assignor to Scripto, Inc., Atlanta, Ga.
Filed May 17, 1972, Ser. No. 254,350
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D48—27 R

229,092
COMBINED WEIGHING SCALE, TAPE MEASURE AND FISHHOOK REMOVER
Michel Quenot, Zone Industrielle Trepillot, Besancon, France
Filed Jan. 5, 1972, Ser. No. 215,695
Claims priority, application France July 12, 1971
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D52—1 R

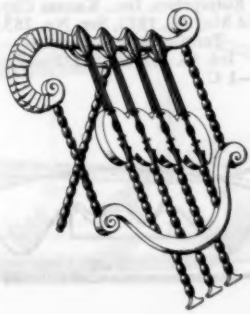
229,093
CENTERLINE GAUGE
Charles J. Fortriede, Redondo Beach, Calif. (4322 Ocean Drive, Manhattan Beach, Calif. 90266)
Continuation-in-part of abandoned design application Ser. No. 21,068, Jan. 26, 1970. This application Jan. 28, 1971, Ser. No. 110,798
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D52—6 B



229,094
GRILLE
Frederick Charles Helwig, Union, N.J., assignor to Construction Specialties, Inc., Cranford, N.J.
Filed Feb. 16, 1971, Ser. No. 115,898
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D54—2 B

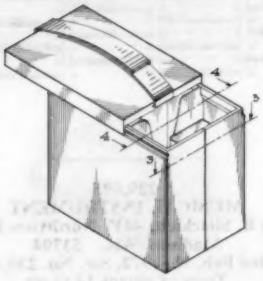


229,095
MUSICAL INSTRUMENT
John B. Shacklett, 4417 Northview Drive, Madison, Wis. 53704
Filed Feb. 28, 1972, Ser. No. 230,167
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1 A



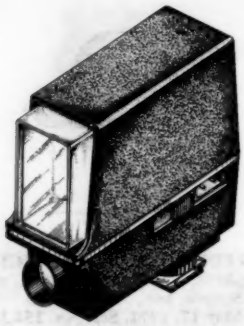
229,096
MUSICAL INSTRUMENT
John B. Shacklett, 4417 Northview Drive, Madison, Wis. 53704
Filed Feb. 28, 1972, Ser. No. 230,188
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1 A

229,097
COMBINED CONTACT LENS SOLUTION, LENS AND WATER TRAY CASE
Douglas James Kroger, 3400 Grimsby Lane, Lincoln, Nebr. 68502
Filed Oct. 14, 1971, Ser. No. 189,480
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D57—1 B

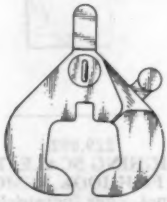


229,098
ADHESIVELY MOUNTED COMBINED EYEGLASS AND COIN HOLDER
Harry T. Reed, Kansas City, Mo., assignor to Smith & Reed Enterprises, Inc., Kansas City, Mo.
Filed May 16, 1972, Ser. No. 253,919
Term of patent 14 years
Int. Cl. D16—*06;* D3—*02*
U.S. Cl. D57—1 C

229,099
CAMERA FLASH ATTACHMENT
Peter T. Quinn, Littleton, Colo., assignor to Honeywell, Inc., Minneapolis, Minn.
Filed Dec. 13, 1971, Ser. No. 207,706
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D61—1 F

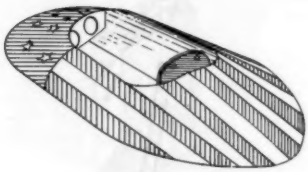


229,100
RAIL CLAMP
S. Anton Wladis, 1120 Lake Shore Drive, Chicago, Ill. 60611
Filed Jan. 12, 1972, Ser. No. 217,421
Term of patent 14 years
Int. Cl. D12—*99*
U.S. Cl. D66—3

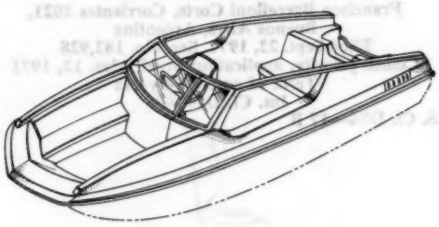


229,101
CONTROLLED TEMPERATURE CHEST
Louis J. Corini, Philadelphia, Pa., assignor to Louis J. Corini, Philadelphia, Pa.
Filed Nov. 18, 1971, Ser. No. 200,279
Term of patent 14 years
Int. Cl. D15—*07;* D7—*02*
U.S. Cl. D67—3 R

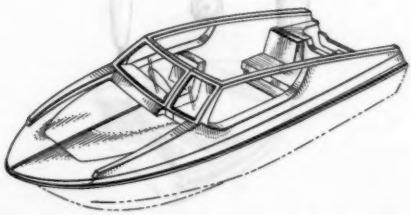
229,102
BOAT
Glen E. Richardson, La Habra, Calif. (% John E. Wagner, Attorney-at-Law, 1041 E. Green St., Suite 202, Pasadena, Calif. 91106)
Filed May 20, 1971, Ser. No. 145,602
Term of patent 7 years
Int. Cl. D12—*06*
U.S. Cl. D71—1 Q



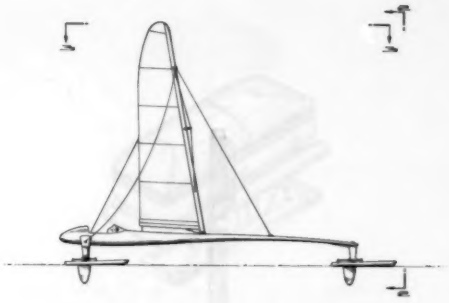
229,103
BOAT UPPER SHELL
Kenneth R. Baker, Shasta County, Ronald Plescia, Santa Clara County, and Gary C. Ferguson, Shasta County, Calif., assignors to Saul Davidson, Denver, Colo.
Filed Sept. 24, 1971, Ser. No. 183,748
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D71—1 S

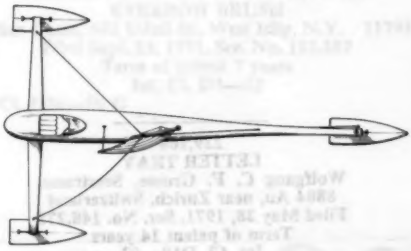


229,104
BOAT UPPER SHELL
Kenneth R. Baker, Anderson, Ronald E. Plescia, San Jose, and Gary C. Ferguson, Redding, Calif., assignors to Saul Davidson, Denver, Colo.
Filed Sept. 24, 1971, Ser. No. 183,720
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D71—1 S

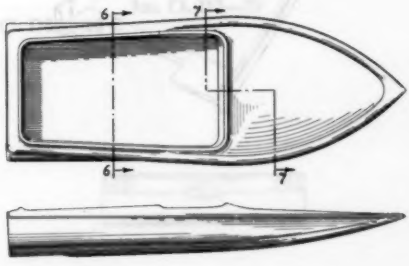


229,105
TRI-HULL SAILING BOAT
Dudley F. Miller, Jr., 25 Hill Drive, Ross, Calif. 94957
Filed Dec. 29, 1971, Ser. No. 213,796
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D71—1 BB



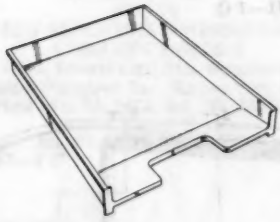


229,106
BOAT HULL
Jack Davidson, 3316 E. Annadale, Fresno, Calif. 93725
Filed Mar. 22, 1972, Ser. No. 237,232
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D71—1 Q



229,107
PLASTIC TIP PEN
Noboru Wakai and Masatoshi Adachi, Tokyo, Japan, assignors to Pentel Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 28, 1970, Ser. No. 26,651
Claims priority, application Japan June 24, 1970
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D74—17 B

229,108
LETTER TRAY
Wolfgang C. F. Grosse, Seestrasse, 8804 Au, near Zurich, Switzerland
Filed May 28, 1971, Ser. No. 148,278
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D74—9 A



229,109
WRITING INSTRUMENT
Raymond A. Lanoie, East Greenwich, R.I., assignor to Lew Mfg. Co., Coventry, R.I.
Filed May 28, 1971, Ser. No. 148,287
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D74—17 B

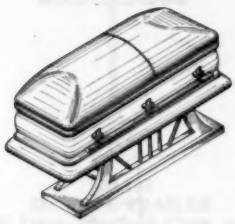
229,110
WRITING INSTRUMENT
Francisco Barcelloni Corte, Corrientes 2021, Buenos Aires, Argentina
Filed Sept. 22, 1971, Ser. No. 182,928
Claims priority, application Brazil Mar. 12, 1971
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D74—17 B

229,111
NEUROSTIMULATION TRANSMITTER OR THE LIKE
Roger E. Avery, Melville, N.Y., assignor to Avery Laboratories Inc., Farmingdale, N.Y.
Filed June 14, 1971, Ser. No. 153,129
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—1 F

229,112
SANITARY NAPKIN HOLDER
Masataka Susuki, Sapporo, Japan, assignor to Daiichi Seiyaku Co., Ltd., Tokyo, Japan
Filed Aug. 24, 1971, Ser. No. 174,585
Term of patent 14 years
Int. Cl. D28—*01*
U.S. Cl. D83—1 A

229,113
BED PAN CUSHION COMFORTER OR THE LIKE
Lewis S. Phares, Jr., 12129 Graystone Ave., Norwalk, Calif. 90650
Filed June 19, 1972, Ser. No. 264,246
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D83—1 V

229,114
BOX FOR CIGARETTES OR THE LIKE
Ambrose P. Noonan, 2004 E. Prospect, Seattle, Wash. 98112
Filed Sept. 21, 1972, Ser. No. 291,039
Term of patent 14 years
Int. Cl. D27—*06*
U.S. Cl. D85—2 B



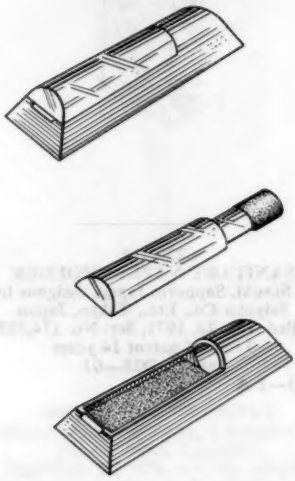
229,115
CASING FOR A LIP BRUSH AND AN EYEBROW BRUSH
Allan Costa, 682 Udall St., West Islip, N.Y. 11795
Filed Sept. 23, 1971, Ser. No. 183,287
Term of patent 7 years
Int. Cl. D3—*02*
U.S. Cl. D86—10 G

229,116
CASE FOR MANICURING IMPLEMENTS OR THE LIKE
Shogo Ishii, Tokyo, Japan, assignor to Syntak Company, Ltd.
Filed Nov. 1, 1971, Ser. No. 194,781
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D86—10 C

229,117
ELECTRICAL MANICURING APPARATUS
Wilhelmus Gerardus Elisabeth Janssens, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Feb. 22, 1972, Ser. No. 228,433
Claims priority, application Netherlands Aug. 30, 1971
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 C

229,118
BOOT EXTRACTOR
Barry S. Shechtman, 822 Buena Coach House 60613, and Arthur Spivak, 714 W. Cornelia Ave. 60657, both of Chicago, Ill.
Filed Mar. 27, 1972, Ser. No. 238,728
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D86—10 D

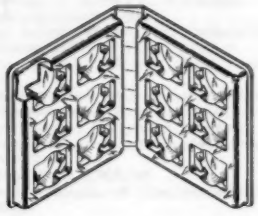
229,119
EYE SHADOW COMPACT
Garfield G. Litton, 1360 Ocean Parkway, Brooklyn, N.Y. 11230
Filed May 5, 1972, Ser. No. 250,865
Term of patent 14 years
Int. Cl. D28—*02*
U.S. Cl. D86—10 G



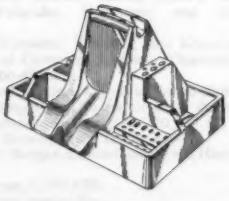
229,120
COMBINED LIPSTICK AND LIP GLOSS POT
Jess A. Bell, Rocky River, Ohio, assignor to Eyelet Specialty Company, Wallingford, Conn.
Filed May 18, 1972, Ser. No. 254,827
Term of patent 14 years
Int. Cl. D28—*02*
U.S. Cl. D86—10 G

229,121
MAKE-UP MIRROR
John L. Benty, Maplewood, N.J., and Dominic Defano, Palatine, and Robert I. Kallman, Elburn, Ill., assignors to Clairol Incorporated, New York, N.Y.
Filed May 23, 1972, Ser. No. 256,221
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 H

229,122
STORAGE ALBUM FOR TAPE CASSETTES OR THE LIKE
Gerald L. Price, Encino, Calif., assignor to Mattel, Inc., Hawthorne, Calif.
Original design application Apr. 17, 1970, Ser. No. 22,480, now Patent No. 225,388, dated Dec. 5, 1972. Divided and this application Apr. 14, 1971, Ser. No. 133,916
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 D



229,123
CADDY FOR ELECTRIC DRILL AND ACCESSORIES
James C. Fry, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Nov. 9, 1971, Ser. No. 197,196
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D87—1 R



229,124
INFLATABLE UMBRELLA
William A. Turner, 205 Sycamore Road, Franklin, Va. 23851
Filed Sept. 21, 1971, Ser. No. 182,578
Term of patent 14 years
Int. Cl. D3—*03*
U.S. Cl. D88—3 R

229,125
BICYCLE TRAILER
Ronald N. Davis, Stamford, Conn., assignor to Cannondale Corporation, Stamford, Conn.
Filed Sept. 28, 1971, Ser. No. 184,648
Term of patent 14 years
Int. Cl. D12—*10*
U.S. Cl. D90—3

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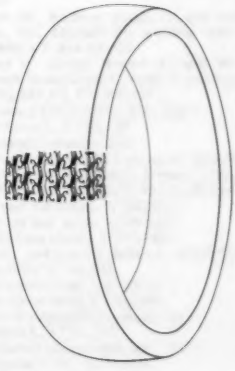
PNEUMATIC TIRE TREAD AND BUTTRESS
Clarence H. Vizina, Jr., Ferndale, and James H. Bierbusse, Grosse Pointe Woods, Mich., assignors to Uniroyal, Inc., New York, N.Y.
Filed Mar. 20, 1972, Ser. No. 236,569
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D90—20 R



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TO WHOM

PATENTS WERE ISSUED ON THE 6TH DAY OF NOVEMBER, 1973

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Bartlet, John Lester; and Feit, Eugene David, to Bell Telephone Laboratories, Incorporated. High sensitivity negative electron resist. 3,770,433, Cl. 96-36.000.

Bartlett, Philip Lee, to Du Pont de Nemours, E. I., and Company. Refrigerants colored for leak indication. 3,770,640, Cl. 252-68.000.

Basa, Napoleon A. Aquatic lounge and tray ensemble. 3,769,647, Cl. 9-400.000.

BASF Wyandotte Corporation: *See*—
Cenker, Moses; and Weipert, Eugene A., 3,770,701.

Bauer, Benjamin B., to Columbia Broadcasting System, Inc. Stereo-quadraphonic disc record. 3,770,901, Cl. 179-100.4st.

Bauer, Peter; and Neradka, Vincent F., to Bowles Fluidics Corporation. Personal spray and massage apparatus. 3,770,200, Cl. 239-102.000.

Baughman, Davis Lee: *See*—
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Baugnies, Francis; Bruyere, Jean; and Michel, Edmond, to Solvay & Cie. Apparatus for removing bodies from a molding machine and transporting the bodies. 3,770,098, Cl. 198-25.000.

Baumer, Wilhelm: *See*—
Schmitt, Dieter; Stein, Alfred; and Baumer, Wilhelm, 3,770,381.

Baumer, Wilhelm; Schmitt, Dieter; and Stein, Alfred, to Merck Patent Gesellschaft mit beschrankter Haftung. Indicator for the detection of manganese (II) ions. 3,770,379, Cl. 23-230.00r.

Bausch & Lomb Incorporated: *See*—
Ambrose, Walter R.; Shone, Robert T.; and Welham, Brian H., 3,770,347.

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Metzger, Sidney H., 3,770,693.

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Lenz, Hans; Kolbe, Joachim; Marzolph, Herbert; and Bernklau, Kurt, 3,770,495.
Scherhag, Bernhard; Wolz, Hermann; and Von Friedrich, Adolf, 3,770,759.
Schubart, Riidiger; Roos, Ernst; and Abele, Manfred, 3,770,826.
Wagner, Kuno; and Hajek, Manfred, 3,770,799.
Witt, Harro; Troemel, Gerhard; and Berndt, Gerhard, 3,770,681.

Bayer, Herbert, to Goltermann, Wandel u. Decadically adjustable oscillation generator with frequency marker. 3,771,061, Cl. 325-67.000.

Beach, Robert C.; and Myers, Stanley L., to Cincinnati Milacron Inc. Method for approximating with linear segments a curvature on a three-dimensional surface. 3,771,168, Cl. 444-1.000.

Bean, Charles P.; and De Sorbo, Warren, to General Electric Company. Porous bodies and method of making. 3,770,532, Cl. 156-7.000.

Beatrice Foods Co.: *See*—
Millar, John M.; and Moran, William F., 3,770,482.

Beaufour, Albert H., to Societe d'Etudes de Produits Chimiques. β-Pyridyl carbinol nicotinoyl glycinate. 3,770,753, Cl. 260-295.50a.

Bechtold, Max F., to Du Pont de Nemours, E. I., and Company. Rotary heat engines. 3,769,796, Cl. 60-108.000.

Beckman Instruments, Inc.: *See*—
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Pratt, Stanley L., 3,770,609.

Beecham Group Limited: *See*—
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Begley, Daniel P. Fishing lure. 3,769,738, Cl. 43-42.260.

Beisemann, Heinz, to Konings, P., Machinefabriek, Ijzer-en Metaal Gieterij N.V. Support devices for elongate members. 3,770,022, Cl. 138-108.000.

Belady, Laszlo A.; De Orazio, William R.; and O'Neill, Robert W., to International Business Machines Corporation. Clock for computer performance measurements. 3,771,144, Cl. 340-172.500.

Belanger, Patrice: *See*—
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Belenky, Alexandr Mikhailovich; Lazko, Viktor Evgenievich; Toschev, Mikhailovich; Bikmametov, Ilgiz Ganeevich; Vilkov, Vladimir Kirillovich; Mosendz, Nikolai Alexandrovich; Yakushina, Galina Mikhailovna; and Mikhailov, Mikhail Vasilievich Poplavko. Weldingelectrode for continuous welding. 3,770,425, Cl. 75-128.00a.

Bell Canada: *See*—
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Kluge, Werner Erich, 3,770,978.

Bell, James Alexander Evert, to International Nickel Company, Inc., The. Level control for rotating furnaces. 3,770,257, Cl. 266-18.000.

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Apple, Garrett Gordon, Jr., 3,771,126.
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Krause, John Thorvald; and Kurkjian, Charles Robert, 3,771,073.
Krupp, Roy Stephen; and Tomko, Lawrence Andrew, 3,770,895.
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Remec, Matthew Joseph, 3,771,080.
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Lademann, Ernest E.; and O'Connor, James J., 3,769,698.

Nocek, Stanley J., 3,769,845.
Presley, Rex W., 3,770,997.
Bengtsson, Sigurd Walter. Fastening device. 3,769,661, Cl. 24-73.0pf.
Benkoe, Erwin; and Cooper, Julius, to Ideal Toy Corporation. Vibratory toy. 3,769,743, Cl. 46-1.00c.
Bennett, Harold W.; and Richards, Barry E., to Raytheon Company. Method of making a memory storage device. 3,769,699, Cl. 29-604.000.
Bennett, Walter V.; and Bose, Norman J., to Singer Company, The. Joy stick digital direction and rate control unit. 3,770,915, Cl. 200-6.00a.
Benson, Albert; Mausner, Marvin; and Carasik, William, to Witco Chemical Company, Inc. Process for producing phosphate ester surface active compositions. 3,770,855, Cl. 269-988.999.
Berdahl, James M., to Mead Johnson & Company, mesne. Substituted 3-phenylindan-1-one oximes. 3,770,828, Cl. 260-566.00a.
Berg, Gerhard; and Nordsiek, Karl-Heinz, to Chemische Werke Huls Aktiengesellschaft. Process for the production of non-discoloring, heat-stable and degradation-resistant polyisoprenes. 3,770,694, Cl. 260-45.90r.
Berg, Ronald, to Institutt for Atomenergi. Method for thermal activation of a surface active material. 3,769,776, Cl. 55-67.000.
Berger, Abe: *See—*
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Bergum, Bernard C., to ESB Incorporated. High discharge rate multicell battery. 3,770,504, Cl. 136-10.000.
Bergum, Bernard C.; Bilhorn, John M.; Kenyon, Kenneth H.; Macaulay, William R.; and Youngquist, John A., to ESB Incorporated. Multicell battery comprising duplex electrode utilizing conductive plastic carrier strip. 3,770,505, Cl. 136-10.000.
Beriger, Conrad: *See—*
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Berner, Warren E., to General Electric Company. Semiconductor device including low impedance connections. 3,771,025, Cl. 317-234.00r.
Bernicot, Bernard. Scaper-extractor. 3,770,099, Cl. 198-36.000.
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Bernklau, Kurt: *See—*
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Berry, Norman H. Ignition circuit radiation suppression structure. 3,771,006, Cl. 313-118.000.
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Berthou, Jean: *See—*
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Bertrand, Jean Jacques. Anchoring device. 3,769,768, Cl. 52-154.000.
Bertrandi, Luigi. Method for producing rubber and like molded articles. 3,770,864, Cl. 264-268.000.
Besel, Fred A. High conductivity aluminum alloys. 3,770,515, Cl. 148-11.50a.
Bethlehem Steel Corporation: *See—*
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Bevan, Christopher Graham, to Bevan, C. G., Associates Limited. Building materials. 3,770,859, Cl. 264-71.000.
Bianesi, Dario; and Pasetti, Adolfo, to Montecatini Edison S.p.A. Fluorinated oxygen-containing copolymers. 3,770,792, Cl. 260-463.000.
Bick, Maurice; and Lochet, Jean A., to Auric Corporation. Gold plating bath for barrel plating operations. 3,770,596, Cl. 204-43.00g.
Biddle, James A., to Lockheed Aircraft Corporation. Wire stripping device. 3,769,705, Cl. 30-90.100.
Bierly, Meade Goodman, to AMP Incorporated. Overcurrent foldback circuit. 3,771,021, Cl. 317-33.0vr.
Biewer, Mathias L., to MSI Data Corporation. Data collection system including controlled partial switching of the data collection modules thereof. 3,771,132, Cl. 340-172.500.
Bikmametov, Ilgiz Ganeevich: *See—*
Belenky, Alexandr Mikhailovich; Lazko, Viktor Evgenievich; Toschev, Mikhailovich; Bikmametov, Ilgiz Ganeevich; Vilkov, Vladimir Kirillovich; Mosendz, Nikolai Alexandrovich; Yakushina, Galina Mikhailovna; and Mikhailov, Mikhail Vasilievich Poplavko, 3,770,45.
Bilas, Michael. Tiltable mounting for dump truck bodies. 3,770,320, Cl. 298-17.00s.
Bilhorn, John M.: *See—*
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Wehr, Robert L.; Rearick, Edward W., Jr.; and Mc Bride, Lemuel R., 3,770,266.
Billet, James; and Gough, Stanely T. D., to Mobil Oil Corporation. Dimethyl 1,2,5-thiadiazol-3-yl phosphate. 3,770,756, Cl. 260-302.00e.
Billi S.p.A.: *See—*
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Bishop, Clyde E., to Continental Oil Company. Conversion of alkyl nitrates to carboxylic acids. 3,770,782, Cl. 260-413.000.
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Bishop, John R. Floating pool cover structure. 3,769,639, Cl. 4-172.120.
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Biswas, Dilip Kumar, to Imperial Chemical Industries Limited. Method for the preparation of thickened slurry explosives. 3,770,523, Cl. 149-14.000.
Bitzer, Donald L.; Bandy, Lyle E.; Johnson, Roger L.; and Skaperdas, Dominic O., to University of Illinois Foundation. Random access selection apparatus. 3,770,012, Cl. 137-596.160.
Black and Decker Manufacturing Company, The: *See—*
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Blackwell, John; and Fenoglio, Richard A., to Du Pont de Nemours, E. I., and Company. 3'-Hydroxyquinophthalone-5-carboxanilide. 3,770,746, Cl. 260-289.0qp.
Blake, John Calvin, to General Electric Company. Shock and vibration isolation mount. 3,770,232, Cl. 248-21.000.
Blastmaster Company, a division of Tekobogy, Limited: *See—*
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Blazer, James J., to Grace, W. R., & Co. Fluid catalytic cracking process with addition of molecular sieve catalyst-liquid mixture. 3,770,615, Cl. 208-120.000.
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Blood, Alden E.; and Statman, Max, to Eastman Kodak Company. Catalytic formation of double bonds. 3,770,812, Cl. 260-486.00d.
Blount, Lester L.; and Hernandez, Armando C. Speculum. 3,769,968, Cl. 128-17.000.
Blum, Josef, to Sorvall, Ivan, Inc. Means for stabilizing high speed rotors. 3,770,191, Cl. 233-23.00a.
Boardman, John D., to Keymatch Computer Corporation. Method and apparatus for credit verification. 3,771,128, Cl. 340-146.200.
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Bobinski, Jack; and Picard, Jean P., to United States of America, Army. Water-resistant consumable cartridge case. 3,770,563, Cl. 161-162.000.
Boblitz, Oliver W., to Safety Systems, Inc. Safety seat-belt and shoulder-belt retractors including a program metering electrical switch. 3,770,225, Cl. 242-107.400.
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Bogard, Adrian E.; and DeValleria, Robert E., to Cities Service Oil Company. Method of selectively electroplating thermoplastic substrates using a strippable coating mask. 3,770,398, Cl. 204-15.000.
Boie, Immo; Schulte, Walter; Pelz, Willibald; Krimm, Heinrich; Freitag, Dieter; and Nittel, Fritz, to Agfa-Gevaert Aktiengesellschaft. Light-sensitive silver halide color photographic material containing indazolone couplers. 3,770,447, Cl. 96-100.000.
Boirat, Robert; and Buissiere, Jean, to Compagnie Generale d'Automatiome Paris. Incubator. 3,770,591, Cl. 195-139.000.
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Bolick, Fred C., Jr., to Lanier Electronic Laboratory, Inc. Apparatus for supporting an index member. 3,771,164, Cl. 346-134.000.
Bolinger, John F., to Meridian Industries, Inc. Flasher circuit. 3,771,019, Cl. 315-200.00a.
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Boll, Harry Joseph; Heightley, John Donnell; Koo, James Teh-Zen; Lynch, William Thomas; Nelson, James Thomas; Bard, Richard; Waaben, Sigurd Gunther; and Waggener, Herbert Atkin, to Bell Telephone Laboratories, Incorporated. IGFET memory system. 3,771,147, I. 340-173.00r.
Bollinger, Edward R., Jr.: *See—*
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Bond, Robert Harold; and Bridges, Robert Owen, to Western Electric Company, Incorporated. Sealed contact switch testing apparatus utilizing Helmholtz coils. 3,771,048, Cl. 324-28.0rs.
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Borders, Donald Bruce; and Lancaster, John Edgar, to American Cyanamid Company. Antifungal 2-(1,4-dioxocin-6-yl)-4H-pyran-4-one and a method for its production. 3,770,773, Cl. 260-338.000.
Borskey, Charles L. Vehicle with retractable and extensible roof assembly. 3,770,314, Cl. 296-137.00b.
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Bourquin, Jean-Pierre; Schwarb, Gustav; and Waldvogel, Erwin, to Sandoz Ltd. 4H-Benzo[4,5]cyclohepta[1,2-b]thiophen-10(9H)-ones. 3,770,728, Cl. 260-240.0tc.
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Breiner, Richard C., to Nicolet Industries, Inc. Asbestos-plastic film laminates. 3,770,569, Cl. 161-205.000.
Breitbach, Johnnie J. Apparatus for transferring trays between a conveyor system and a stack. 3,770,143, Cl. 214-6.0ds.
Bremmer, Bart J.; and Meyer, Fred J. Higher alkyl derivatives of 2-hydroxypro-pylisothiouronium salts and their use in sizing paper. 3,770,576, Cl. 162-158.000.
Brenneman, J. Edward; and Enders, Ray H., to Schick, Incorporated. Electric light system for a motor-driven appliance. 3,770,950, Cl. 240-2.0bb.
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Bressanelli, Jerome P., to Crucible, Inc. Stainless steel tubing with a maximum titanium to carbon ratio of 6. 3,770,394, Cl. 29-193.000.
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Brewer, Harry L., Jr. Disposable shipping container for concrete samples. 3,770,117, Cl. 206-46.0fc.
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Brooks, Frank W.; and Sebring John G., to General Motors Corporation. Disc brake caliper assembly. 3,770,082, Cl. 188-71.900.
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Brown, Harry D., 50% to Lewis, Ebert E. Pyrolysis process system for recycling of refuse. 3,770,419, Cl. 75-63.000.
Brown, Henry, to Oxy Metal Finishing Corporation, mesne. Electroplating of nickel. 3,770,730, Cl. 260-240.00f.
Brown International Corporation: *See—*
Brockins, Richard R.; and Miller, John Paul, 3,770,130.
Brown, Lawrence C. Automatic water shut-off system. 3,770,002, Cl. 137-312.000.
Brown, Leland A., to Electrical Fittings Corporation. Electrical outlet box construction. 3,770,872, Cl. 174-53.000.
Brown, Leland A., to Electrical Fittings Corporation. Plastic electrical junction box. 3,770,873, Cl. 174-58.000.
Bruckner, Richard; and Tansky, John L., to Bunker Ramo Corporation. Electrical connector for integrated circuit device. 3,771,109, Cl. 339-174.000.
Brugger, Donald J.; and Hagenbuch, Barry R. Photographic bleach compositions. 3,770,437, Cl. 96-60.00r.
Brumfield, Robert C.; and Simmons, Edward E., to Williams Harvey Research Corporation. Manually flexible blood filter. 3,770,129, Cl. 210-232.000.
Brumfield, Robert C. Two-phase fluid flow guide for blood oxygenator. 3,770,384, Cl. 23-258.500.
Brunswick Corporation: *See—*
Conklin, Robert M., 3,769,894.
Elingsen, Raymond L., 3,769,949.
Bruyere, Jean: *See—*
Baugnies, Francis; Bruyere, Jean; and Michel, Edmond, 3,770,098.

Brzezinski, Kazimierz J., to American Metal Climax, Inc. Building wall construction. 3,769,775, Cl. 52-731.000.

Buchan, William Arthur; and Ring, John Joseph, to Century Data Systems, Inc. Accoustical tape loop sensor. 3,771,114, Cl. 340-1.00r.

Buchwald, Joachim: *See*—
Huttinger, Wilhelm; Von Almasy, Heinz; and Buchwald, Joachim, 3,770,644.

Buckbee-Mears Company: *See*—
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Mentone, Pat F., 3,770,594.

Buckeye Steel Castings Company: *See*—
Glenn, Harry D., 3,770,139.

Buckler, Lawrence A., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Wave measuring apparatus. 3,769,838, Cl. 73-170.00a.

Buckler, Robert Thomas; and Hartzler, Harold Eugene, to Miles Laboratories, Inc. Substituted beta-arylamidoacrylic acids. 3,770,821, Cl. 260-518.00r.

Bucklin, Lyston E.: *See*—
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Buckner, Harry F. Insect escapement for screens. 3,770,043, Cl. 160-16.000.

Bucourt, Robert: *See*—
Gasc, Jean-Claude; and Bucourt, Robert, 3,770,725.

Buhren, Wilhelm: *See*—
Hoek, Serge; and Buhren, Wilhelm, 3,770,199.

Buissiere, Jean: *See*—
Boirat, Robert; and Buissiere, Jean, 3,770,591.

Bulaeva, Svetlana Ivanovna: *See*—
Pavlov, Jury Vasilievich; Petrov, Alexandr Aleseevich; Nikolsky, Viktor Alexandrovich; Chunyaeva, Raisa Ivanovna; and Filin, Leonid Alexandrovich, 3,769,820.

Bullock, Frederick C., to Hercules Incorporated. Process for manufacturing resin-filament composites. 3,770,539, Cl. 156-155.000.

Bundy, Gordon L., to Upjohn Company, The. Silylated prostaglandins and process therefor. 3,770,788, Cl. 260-448.80r.

Bunker Ramo Corporation: *See*—
Bruckner, Richard; and Tansky, John L., 3,771,109.
Elkins, Lujene, 3,771,101.
Haffner, Helmut Hubert; Kannheiser, Lothar Karl; and Schmied, Wilhelm, 3,771,108.
Johnston, Samuel, 3,771,094.
Scarbrough, Alfred D., 3,769,702.

Burch, Homer Albert, to Morton-Norwich Products, Inc. 3-Alkyl-4-bis(2-hydroxyethyl)amino-6-(5-nitro-2-furyl) isoxazolo(5,4-d)pyrimidines. 3,770,740, Cl. 260-256.40f.

Burdge, David N., to Marathon Oil Company. Flooding with miscible-type fluid slugs having different brine tolerances. 3,770,649, Cl. 252-312.000.

Burenga, Thomas I., to FMC Corporation. Legume harvester with auger feeds. 3,769,988, Cl. 130-30.00h.

Burgwald, Glenn M.; Kruger, William P.; and Hammond, Donald L., to Hewlett-Packard Company. Gas laser. 3,771,066, Cl. 331-94.50d.

Burnett, Jimmy D., to United States of America, Army. Vinyl ferrocene butadiene copolymer burning rate catalyst. 3,770,787, Cl. 260-439.0cy.

Burnsweig, Joseph, to Hughes Aircraft Company. Electronically controllable time delay circuits. 3,771,062, Cl. 328-55.000.

Burroughs Corporation: *See*—
Houghton, Frank A.; Wasielewski, Leonard; and Kinner, James L., 3,770,162.
Taylor, Warren I., 3,771,143.

Burton, Duane C. Concrete form. 3,770,237, Cl. 249-3.000.

Burton, Paul E.: *See*—
Wellman, William E.; Burton, Paul E.; and Diana, William D., 3,770,829.

Burtscher, Joachim; Frohmader, Karl-Peter; Porst, Alfred; and Voss, Peter, to Siemens Aktiengesellschaft. Thyristor with auxiliary emitter connected to base between base groove and main emitter. 3,771,029, Cl. 317-235.00r.

Bussey, Marlin G.: *See*—
Corbett, John M.; Bussey, Marlin G.; and Killingbeck, Graydon Wayne, 3,770,668.

Butler, Donald E., to Parke, Davis & Company. Diazepine compounds and methods for their production. 3,770,762, Cl. 260-308.00r.

Butler, Jaguith Gould; and Mack, Alfred, to RCA Corporation. Universal data quality monitor. 3,771,059, Cl. 325-31.000.

Butler, Luther C., Jr., to Lorain Products Corporation. Majority logic system. 3,770,982, Cl. 307-215.000.

Butti, Adriano; Prino, Giuseppe; and Bertellini, Gianfranco, to Crinos Industria Farmacobiologica S.p.A. Process for the extraction of alkali salts of deoxyribonucleic acid from animal organs. 3,770,720, Cl. 260-211.50r.

Byrne, Thomas J., to American District Telegraph Company. Defeat resistant burglar alarm contact. 3,771,153, Cl. 340-274.000.

Cabernoch, James L.: *See*—
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Cabot Corporation: *See*—
Swank, Thomas F., 3,770,470.

Cabot Corporation, mesne: *See*—
Herchenroeder, Robert Blanchard Herman, 3,770,391.

Caesar, Michael B.: *See*—
Mills, Harold E.; and Caesar, Michael B., 3,770,410.

Cahoon, Samuel L.; Steelman, Clifton V.; and Welch, Lawrence E. Vibratory concrete applicator. 3,770,248, Cl. 259-1.000.

Calgon Corporation: *See*—
Gordon, Robert Cornelius, Jr., 3,770,652.

Calhoun, Harry C.; and Kaufman, Carl L., to International Business Machines Corporation. Monolithic integrated circuit resistor design for optimum resistor tracking. 3,771,095, Cl. 338-320.000.

Calnor of El Paso, Inc.: *See*—
Barrett, Ronald E., 3,771,063.

Camiciottoli, Roberto; and Marchini, Dino, to Societa Italiana Telecomunicazioni Siemens S.p.A. System for remote supervision of two-way repeater stations in multichannel PCM telecommunication path. 3,770,913, Cl. 179-175.30r.

Camosso, Domenico, to RIV-SKF Officine di Villar Perosa S.p.A. Device for conveying fluid into a rotatable hollow casing. 3,770,305, Cl. 285-110.000.

Campbell, David W.; and Matthews, Robert R., to Continental Oil Company. Method of increasing recovery of petroleum from subterranean formations. 3,770,056, Cl. 166-273.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See*—
Buckler, Lawrence A., 3,769,838.

Canat, Christian, to Etablissements Hutchinson-Compagnie Nationale du Caoutchouc. Process for the production of leather substitute. 3,770,481, Cl. 117-10.000.

Cannell, James N. Packaging container for pies. 3,770,115, Cl. 206-45.320.

Canon Kabushiki Kaisha: *See*—
Kawakubo, Kazuo; Fujii, Motoharu; and Ariga, Masao, 3,770,345.

Cantor, Abraham; and Winicov, Murray W., to West Laboratories, Inc. Indicator means for consumer mixing of multicomponent systems. 3,770,641, Cl. 252-90.000.

Caputo, James P.; Chybowski, Robert J.; and Harrington, Phil R., to GTE Automatic Electric Laboratories Incorporated. Data handling system maintenance arrangement. 3,770,948, Cl. 235-153.0ae.

Carasik, William: *See*—
Benson, Albert; Mausner, Marvin; and Carasik, William, 3,770,855.

Carbone, Angelo F., to Fallacaro, Emmanuele. Method and apparatus for manufacturing honeycomb structures. 3,770,549, Cl. 156-474.000.

Carborundum Company, The: *See*—
Carpenter, James H., 3,770,218.
Ixer, Bernard W.; and Baughman, Davis Lee, 3,769,754.
Wallis, Craig; and Melnick, Joseph L., 3,770,625.

Cardwell, John William, to Lucas, Joseph, (Industries) Limited. Vehicle ignition switch. 3,770,916, Cl. 200-44.000.

Carignani, Milvio; Conti, Michele; Berte, Dufour; Rossi, Geremia; Pasero, Edoardo; and Zmolnig, Hermann, to Italsider S.p.A. Method for recovering iron from blast furnace and basic oxygen furnace wastes. 3,770,415, Cl. 75-3.000.

Carlsen, Carl: *See*—
Lorentzen, Jurgen; Christiansen, Christian Verner; and Carlsen, Carl, 3,769,717.

Carlson, Bernard E. Bulk material handling vehicle and unloading boom therefor. 3,770,101, Cl. 198-115.000.

Carlson, Elmer T. Totally enclosed cablebus. 3,770,875, Cl. 174-88.00b.

Carlson, Elmer Victor: *See*—
Knowles, Hugh Shaler; and Carlson, Elmer Victor, 3,770,911.

Carney, Charles R., to Carney, Charles R., mesne. Trim tabs for boats. 3,769,927, Cl. 114-66.50p.

Carney, Charles R., mesne: *See*—
Carney, Charles R., 3,769,927.

Carothers, David B.; Rearick, Edward W.; and McBride, Lemuel R., to Billco Manufacturing Inc. Apparatus for automatically breaking out a scored glass bracket. 3,770,173, Cl. 225-2.000.

Carpenter, James H., to Carborundum Company, The. Apparatus for granulating molded sand. 3,770,218, Cl. 241-301.000.

Carraro, Giorgio: *See*—
Gozzo, Franco; and Carraro, Giorgio, 3,770,823.

Carter, David L.: *See*—
Collins, Dean R.; and Carter, David L., 3,771,149.

Carter, Elbert P.; Johnson, Donald R.; McErlane, James E.; Nadeau, Richard G.; and Nieuweboer, Gerrit, to Du Pont de Nemours, E. I., and Company. Automatic clinical analyzer. 3,770,382, Cl. 23-253.00r.

Carter, Jack L.: *See*—
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Cartwright, Robert S., to Stewart-Warner Corporation. Pull. 3,769,655, Cl. 16-126.000.

Carver, Charles M. Driving tool for floor tar insert elements. 3,769,682, Cl. 29-255.000.

Casau, Celestin J.: *See*—
Rosztoczy, Ferenc E.; Casau, Celestin J.; and Kinoshita, Joshyo, 3,770,518.

Case, Derek Frank: *See*—
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Case, Wayne. Roofing took roofing kit, and method of using same. 3,769,644, Cl. 7-8.10r.

Casely, Robert E.: *See*—
Jungerman, Eric; and Casely, Robert E., 3,770,642.

Casey, William R., to Goodyear Tire & Rubber Company, The. Tire building apparatus. 3,769,856, Cl. 74-675.000.

Casio Computer Co., Ltd.: *See*—

Kashio, Toshio, 3,771,133.
Cass, Donald T. Stock market game. 3,770,277, Cl. 273-135.00c.
Castello, Leo J. Automatic jumping device. 3,770,268, Cl. 272-74.000.
Castronovo & Edwards: *See*—
Castronovo, Robert F., 3,769,640.
Castronovo, Robert F., to Castronovo & Edwards. Dispenser. 3,769,640, Cl. 4-228.000.
Caterpillar Tractor Company: *See*—
Cobb, Delwin E.; Kepner, Carl L.; Roberts, Wayne E.; and Woody, Albert L., 3,770,322.
Kirchgessner, Edwin M.; and Jones, Nelson A., 3,770,231.
Peifer, Gary S.; Hughes, James L.; and Johnson, Virgil H., 3,769,852.
Cates, Harold T.; and Darling, Ray E., to Martin Marietta Corporation. Process for preparing nuclear hardened semiconductor and microelectronic devices. 3,769,693, Cl. 29-574.000.
Cavalleri, Bruno; Bellasio, Elvio; Testa, Emilio; and Maffii, Giulio, to Gruppo Lepetit S.p.A. α-Fluoro-1-naphthalenemalonic acid and derivatives thereof. 3,770,803, Cl. 260-475.0fr.
Cawthorn, Joel M. Stone guitar with tuned neck. 3,769,871, Cl. 84-291.000.
Celada, Juan; Mackay, Patrick W.; Garcia, Gilberto Guerra; Martinez, Enrique R.; and Villasenor, Antonio, to Fierro Esponja, S.A. Method and apparatus for controlling the composition. 3,770,421, Cl. 75-91.000.
Celanese Corporation: *See*—
Favstritsky, Nicolai Alexander; and Stautzenberger, Adin L., 3,770,837.
Scott, Robert H.; and Lockhart, Hildred B., 3,770,377.
Celeste, Jack Richard. Photopolymerizable transfer elements. 3,770,438, Cl. 96-67.000.
Celtruda, Joseph Drazio; Crosthwait, William Russell; Earle, John Goddell; Fennel, John Wenard, Jr.; and Henderson, Roy Francis, to International Business Machines Corporation. Apparatus and method for serializing instructions from two independent instructon stream. 3,771,138, Cl. 340-172.500.
Cenker, Moses; and Weipert, Eugene A., to BASF Wyandotte Corporation. Heteric nonionic surfactants having enhanced detergency. 3,770,701, Cl. 260-65.00b.
Centre Stephanois de Recherches Mecaniques Hydromecanique et Frottement: *See*—
Cros, Georges; and Mazet, Guy, 3,770,595.
Century Data Systems, Inc.: *See*—
Buchan, William Arthur; and Ring, John Joseph, 3,771,114.
Ceroll, Gerald E., to General Mills, Inc. Splicer tape assembly for use in tape winding machines. 3,770,551, Cl. 156-506.000.
Chadwick, Philip, to General Electric Company. Margin angle control for HVDC converter having improved valve current monitor. 3,771,041, Cl. 321-5.000.
Chadwick-Helmuth Electronics, Inc.: *See*—
Helmuth, James G., 3,770,338.
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Greenwood, Charles S.; and Chamberlin, Donald W., 3,770,111.
Chambers, James C.; and Kimbro, William S., said Kimbro assor. to Organic Laboratories, Inc. Plant stimulant. 3,770,411, Cl. 71-24.000.
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Chapman, George, Jr., to Johnson & Johnson. Covering for a seed or plant bed. 3,769,747, Cl. 47-31.000.
Chartet, Andre, to Societe Anonyme des Usines Chausson. Method for brazing aluminum radiators. 3,769,675, Cl. 29-157.30r.
Chechak, Jonas J., to Eastman Kodak Company. Liquid developers containing metal salts of acid dyes. 3,770,638, Cl. 252-62.100.
Chemische Werke Huls Aktiengesellschaft: *See*—
Berg, Gerhard; and Nordsiek, Karl-Heinz, 3,770,694.
Hamann, Karl; Dittmann, Walter; Sunder-Plassmann, Paul; and Gorke, Klaus, 3,770,688.
Jurgeleit, Wolfgang; and Winter, Hermann, 3,770,665.
Kuhlow, Burkhard; Polte, Arnold; and Michels, Alfred, 3,770,670.
Chen, Yen-Sun; Fukui, Hatsuaki; Gordon, Eugene Irving; Krupka, Dan Charles; and Rowen, John Howard, to Bell Telephone Laboratories, Incorporated. Gaseous discharge display device. 3,771,008, Cl. 313-218.000.
Cheney, Jack E. Traction increasing apparatus. 3,770,072, Cl. 180-24.090.
Cherdron, Harald: *See*—
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Cherry Electrical Products Corporation: *See*—
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Cherry, James R., to Motorola, Inc. Regulated commutated alternator. 3,770,996, Cl. 310-68.00d.
Chicken Unlimited, Inc.: *See*—
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Childers, Thomas W., to Esso Production Research Company. Installation of underwater pollution control apparatus. 3,770,052, Cl. 166-.500.
Childress, Richard; and Kemper, John A., Jr., to General Motors Corporation. Method of vinyl covering a refrigerator door panel. 3,770,546, Cl. 156-245.000.
Chisholm, Raymond S., to Nora International Company, mesne. Novel electrode. 3,770,613, Cl. 204-290.00r.
Chiusoli, Gian Paolo; Ferraris, Mario; Baldratti, Giuliana; and Menozzi, Milena, to Societa Farmaceutici Italia. Tetramethylenumbelliferone diphenyl-4-acetate. 3,770,775, Cl. 260-343.20r.
Chong, Victor Manuel, to Sun Research and Development Co. Coal gasification process. 3,770,399, Cl. 48-202.000.
Chono, Koji; and Matsuo, Toshiaki, to Nippon Zeon Co., Ltd. Catalyst and process for polymerizing epoxy using said catalyst. 3,770,664, Cl. 260-2.00a.
Chorak, Peter P.: *See*—
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Christiansen, Christian Verner: *See*—
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Claassen, Peter J. M. W.: *See*—
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Clanan, Wayne N. Combination wheel chair and commode chair. 3,769,638, Cl. 4-134.000.
Clapper, Genung Leland, to International Business Machines Corporation. Connected word recognition system. 3,770,892, Cl. 179-1.0sb.
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Clark, Chester G., to Oxy Metal Finishing Corporation. Work carrier lift and transfer mechanism. 3,770,150, Cl. 214-89.000.
Clark, Edward Watson, to Woolcombers Limited; a/t/a Westbrook Lanolin Company. Production of iodophors of chlorinated alkoxylated wool grease. 3,770,784, Cl. 260-408.000.
Clark, Harold A., to Dow Corning Corporation. Phenoxyphenyl silanes. 3,770,790, Cl. 260-448.20b.
Clark, Jack D.: *See*—
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Clark, Marvin A. Modular element for a solderless expandable terminal strip. 3,771,104, Cl. 339-31.00r.
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Clarke Chapman-John Thompson Limited: *See*—
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Clarke, Eric C.; and Lindsay, Iain Hardy, to Profile Identification (Proprietary) Limited. Indexing of plane shapes. 3,769,709, Cl. 33-1.0bb.
Cler, Paul L. Corn detasseling head. 3,769,782, Cl. 56-51.000.
Cless, Gerhard, to Teletype Corporation. Plural lineal movement system and process. 3,771,035, Cl. 318-135.000.
Cline, Alvis E., to Midland-Ross of Canada Limited. System for broke removal. 3,770,579, Cl. 162-264.000.
Coates, Clarence A., Jr.: *See*—
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Cobb, Delwin E.; Kepner, Carl L.; Roberts, Wayne E.; and Woody, Albert L., to Caterpillar Tractor Company. Apparatus for fracture of material in situ with stored inertial energy. 3,770,322, Cl. 299-37.000.
Cochon, Rene P., to International Business Machines Corporation. Manipulation apparatus. 3,769,794, Cl. 60-594.000.
Coenen, Renier Gertruda Hubertus: *See*—
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Cohen, Leonard D.; Shortt, Brian A.; and Urban, Michael J., to GTE Laboratories Incorporated. Broad band frequency doubler and

limiter utilizing magneto-resistive effect in a rotating magnetic field. 3,771,044, Cl. 321-69.0nl.

Colburn, Steven C.; McPherson, Charles Q.; and Miller, Roger A., to General Dynamics Corporation. Composite magnetic mirror and method of forming same. 3,770,335, Cl. 350-1.000.

Colchagoff, Robert D., to Owens-Illinois, Inc. Apparatus for guiding gobs of molten glass. 3,770,409, Cl. 65-225.000.

Colclough, Terence: *See—*
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Collins, Dean R.; and Carter, David L., to Texas Instruments, Incorporated. Charge coupled optical scanner. 3,771,149, Cl. 340-173.0lt.

Collins, John J.; and Reber, Raymond A., to Union Carbide Corporation. Hydrocarbon separation using a selective absorption process with purge gas conservation. 3,770,621, Cl. 208-310.000.

Collins, Neil E.; and Halt, Ira E., to General Electric Company. Ohmic contact for group III-V p-type semiconductors. 3,769,694, Cl. 29-589.000.

Collins, Paul W.; and Pappo, Raphael, to Searle, G. D., & Co. 2-(Hydroxy-1-alkynyl)-5-oxocyclopent-1-eneheptanoic/octanoic acids and derivatives thereof. 3,770,776, Cl. 260-345.700.

Collins, Robert F., to Kendall Company, The, mesne. Surgical drape. 3,769,971, Cl. 128-132.00d.

Columbia Broadcasting System, Inc.: *See—*
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Columbia Products Company: *See—*
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Combustion Engineering, Inc.: *See—*
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Combustion Power Company, Inc.: *See—*
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Comes, Roger A., to Morris, Philip, Incorporated. Cyclopropyl cyclohexanes. 3,770,836, Cl. 260-631.00r.

Compagnie Francaise des Petroles: *See—*
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Compagnie Generale d'Automatiome Paris: *See—*
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Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
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Compagnie Maritime d'Expertires: *See—*
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Condon, John J. Prophy attachment for dental contra-angle. 3,769,707, Cl. 32-27.000.

Condux-Werke-Herbert A. Merges K.G.: *See—*
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Conerly, Howard Jeffery, to International Telephone and Telegraph Corporation. Cama/lama transverter. 3,770,893, Cl. 179-7.0mm.

Conklin, Robert M., to Brunswick Corporation. Golf game. 3,769,894, Cl. 95-85.000.

Connor, Dale C.; and McDonough, Robert P., to Harris-Intertype Corporation. Fast recovery low distortion limiter circuit. 3,770,984, Cl. 307-237.000.

Conservor, Inc.: *See—*
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Container Corporation of America: *See—*
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Continental Can Company, Inc.: *See—*
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Continental Oil Company: *See—*
Bishop, Clyde E., 3,770,782.
Campbell, David W.; and Matthews, Robert R., 3,770,056.

Continental Ore Corporation: *See—*
Lake, James L.; Litz, John E.; Coleman, Robert B.; Goldenberg, Marcel; and Vojkovic, Milos, 3,770,414.

Contreras, Alberta L. Laundering bag. 3,769,819, Cl. 68-213.000.

Cooper, Joseph, to Scovill Manufacturing Company. Adjustable weaving loom. 3,769,667, Cl. 28-15.000.

Cooper, Julius: *See—*
Benkoe, Erwin; and Cooper, Julius, 3,769,743.

Corbett, John M.; Bussey, Marlin G.; and Killingbeck, Graydon Wayne, to Dow Chemical Company, The. Styrene polymer foam and the preparation thereof. 3,770,668, Cl. 260-2.50e.

Corelli, Conrad: *See—*
Corelli, John M., 3,770,951.

Corelli, John M.; deceased (by Corelli, Conrad; executors). Christmas tree lights. 3,770,951, Cl. 240-10.00t.

Corey, Albert E.; Donermeyer, Donald D.; Fantl, Joel; and Williams, Charles R., to Monsanto Company. Process for the preparation of a poly(vinyl acetate-dialkyl maleate-acrylic acid) latex. 3,770,679, Cl. 260-29.6ta.

Corini, Louis J., to Melbro Corporation. Revolving display capsule. 3,769,805, Cl. 62-3.000.

Cormak, Anthony F.: *See—*
Gray, John H.; Schneider, Alfred; Cormak, Anthony F.; and Ayers, Arnold L., 3,770,612.

Cosgrove, Lee A.; and McEvoy, James L., to Air Products and Chemicals, Inc. Auto emissions catalyst. 3,770,659, Cl. 252-465.000.

Cosserat, David Cockburn: *See—*
Cotton, John Michael; Williams, James Jeffrey Llewelyn; and Cosserat, David Cockburn, 3,771,146.

Cote, Raymond A., to Riegel Paper Corporation. Display carton. 3,770,116, Cl. 206-45.140.

Cottam, Spencer: *See—*
Davis, Stevens S.; and Cottam, Spencer, 3,770,131.

Cotter, George H.; and Hanes, William C., to Union Carbide Corporation. Short-circuit inert gas consumable electrode process using additions of 10-14% nitrogen. 3,770,932, Cl. 219-74.000.

Cottingham, Edgar R., to General Motors Corporation. Vehicle clutch and brake. 3,770,085, Cl. 192-13.00r.

Cotton, John Michael; Williams, James Jeffrey Llewelyn; and Cosserat, David Cockburn, to Plessey Handel und Investments A.G. Data processing system interrupt arrangements. 3,771,146, Cl. 340-172.500.

Coulter Electronics, Inc.: *See—*
Hogg, Walter R., 3,771,058.

Court, Patrick R. J., to Garrity, Paul G. Lighter and flame regulator. 3,770,367, Cl. 431-277.000.

Cousin, Barry D., to Plas-Steel Products, Inc. Line guide attachment for fishing rods. 3,769,735, Cl. 43-24.000.

Coyne, Hugh J.: *See—*
Weber, Jonathan T.; Brofft, B. Warren; and Coyne, Hugh J., 3,770,287.

Cozzarin, Virgil J.: *See—*
Kipple, Harry P.; Kapperman, Francis C., deceased; and Cozzarin, Virgil J., 3,769,756.

CPC International Inc.: *See—*
Heady, Robert E.; and Jacaway, William A., Jr., 3,770,589.

Craft, William Henry; and Schonhorn, Harold, to Bell Telephone Laboratories, Incorporated. Bonding substance for the fabrication of integrated circuits. 3,770,531, Cl. 156-3.000.

Craggs, Lester R., to Arvin Industries, Inc. Magnetic disc recorder with a carriage for receiving and moving a cassette into playing position. 3,770,908, Cl. 179-100.20a.

Crain, Norman R., to Lucas Radiator and Refrigeration, Inc. Auxiliary engine cooling apparatus. 3,769,947, Cl. 123-41.010.

Crane Canada Limited: *See—*
Johnstone, Robert F.; and Balasubramanian, Kodandraman, 3,770,016.

Crane, Jacob: *See—*
Pryor, Michael J.; Crane, Jacob; and Winter, Joseph, 3,770,396.

Credner, Hans-Heinrich: *See—*
Pelz, Willibald; Credner, Hans-Heinrich; Schulte, Walter; Klein, Alfons; Wedemeyer, Karlfried; and Nittel, Fritz, 3,770,445.

Creutz, Hans-Gerhard, to Oxy Metal Finishing Corporation. Electrodeposition of copper from acidic baths. 3,770,598, Cl. 204-52.00r.

Crinos Industria Farmacobiologica S.p.A.: *See—*
Butti, Adriano; Prino, Giuseppe; and Bertellini, Gianfranco, 3,770,720.

Criss, George H., to Dresser Industries, Inc. Method of extruding silica compositions. 3,770,867, Cl. 264-294.000.

Crockett, David E.: *See—*
Haas, Charles B.; Taylor, Richard E.; Crockett, David E.; Miller, James F.; Paul, Howard R.; and Reid, Charles J., 3,769,876.

Cronce, Grant Woodrow, to Eltra Corporation. Spring action terminal with locked barrel. 3,771,113, Cl. 339-256.00c.

Cronin, David J.; Pinard, Alward I.; and Smith, Albert L., to Technical Operations, Incorporated. Coherent optical system with expanded bandwidth and noise suppression. 3,770,340, Cl. 350-162.0sf.

Cros, Georges; and Mazet, Guy, to Centre Stephanois de Recherches Mecaniques Hydromecanique et Frottement. Method of treatment of steel parts in order to increase their resistance to wear and abrasion. 3,770,595, Cl. 204-29.000.

Crosman, Dorland L., to Remco Industries, Inc. Tearing doll with rotatable head. 3,769,745, Cl. 46-135.00a.

Cross, Budd David: *See—*
Arndt, Charles J.; and Cross, Budd David, 3,770,253.

Crosthwait, William Russell: *See—*
Celtruda, Joseph Drazio; Crosthwait, William Russell; Earle, John Goddell; Fennel, John Wenard, Jr.; and Henderson, Roy Francis, 3,771,138.

Crowe, William J.; Ritchie, Kim; and Gurev, Harold S., to Motorola, Inc. Liquid phase deposition of thin insulating and refractory film on a substrate. 3,770,499, Cl. 117-221.000.

Crucible, Inc.: *See—*
Bressanelli, Jerome P., 3,770,394.

Culler, Glen J., to Culler-Harrison, Inc. Data processor with parallel operations per instruction. 3,771,141, Cl. 340-172.500.

Culler-Harrison, Inc.: *See—*

Culler, Glen J., 3,771,141.

Culligan, Robert L., to Xerox Corporation. Photoelectrophoretic apparatus using pyramid gears. 3,769,850, Cl. 74-462.000.

Culp, Norris B. Exhaust polarizing apparatus. 3,769,799, Cl. 60-303.000.

Culpepper, Ronald N.: *See—*
Schoolar, Richard B.; Lequin, Doris S.; Mathews, Harry E., Jr.; and Culpepper, Ronald N., 3,770,565.

Curran, William J.; and Kulik, John J., to United States of America, Navy. Luminance control circuit for multi-color periscope view simulator. 3,770,884, Cl. 178-5.40r.

Curran, William J.; and Kulik, John J., to United States of America, Navy. Color electronic periscope view simulator. 3,770,885, Cl. 178-6.000.

Cusic, John W.; and Le Von, Ernest F., to Searle, G. D., & Co. N-[z-(nitro-1-imidazolyl)ethyl]imides. 3,770,763, Cl. 260-309.000.

Cusker, Patrick J. Filing cabinet construction. 3,770,333, Cl. 312-183.000.

Cutter Laboratories, Inc.: *See—*
Hardie, Waldo Richard; and Tankersley, Donald L., 3,770,743.

Da Re, Paolo: *See—*
Sianesi, Enrico; Da Re, Paolo; Setnikar, Ivo; and Massarani, Elena, 3,770,733.

Dadic, Miroslav: *See—*
Van Gheluwe, Joris E. A.; and Dadic, Miroslav, 3,770,455.

Dadic, Miroslav; Van Gheluwe, Joris E. A.; and Valyi, Zoltan, to Molson Industries, Limited. Stabilization of fermented malt beverages. 3,770,453, Cl. 426-227.000.

Dahm, Johann: *See—*
Borck, Joachim; Dahm, Johann; Hovy, Jan Willem; Kramer, Josef; and Wild, Albrecht, 3,770,748.

Daimler-Benz Aktiengesellschaft: *See—*
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Frings, Horst; Braun, Gunter; Mosle, Ernst; and Schmid, Ludwig, 3,769,860.
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Dainippon Pharmaceutical Co., Ltd.: *See—*
Matsumoto, Jon-Ichi; Sekine, Yutaka; Takase, Yoshiyuki; and Nakamura, Shinichi, 3,770,742.

D'Alelio, Gaetano F., to PPG Industries, Inc. Radiation crosslinkable polymers prepared by reacting a polyepoxy compound with an acrylic anhydride of a monocarboxylic acid. 3,770,602, Cl. 204-159.150.

Dalpak Corporation, The: *See—*
Long, Donald V.; Derby, Norwin Cedric; and Chorak, Peter P., 3,770,189.

D'Amico, John Joseph: *See—*
Boustany, Kamel; D'Amico, John Joseph; and Sullivan, Alfred Bay, 3,770,707.

Dana Corporation: *See—*
Angilella, Anthony G.; and Wallace, William P., 3,770,286.

Danfoss A/S: *See—*
Andresen, Jens Nicolai, 3,771,090.
Jespersen, Hans Jorgen, 3,769,811.

Daniels, Wiley Edgar: *See—*
Field, Nathan D.; and Daniels, Wiley Edgar, 3,770,851.

Darabant, Richard M., to American Greetings Corporation. Tailored bow making machine. 3,770,543, Cl. 156-204.000.

Darling, Ray E.: *See—*
Cates, Harold T.; and Darling, Ray E., 3,769,693.

Darnell, Alfred J., to Rockwell International Corporation. Process for purifying EU and YB and forming refractory compounds therefrom. 3,770,422, Cl. 75-103.000.

Dart Industries Inc.: *See—*
Haag, Arthur P.; and Weiner, Meyer, 3,770,656.
Haag, Arthur P., 3,770,657.
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Dattilo, Donald J., to Motorola, Inc. Capstan housing assembly for a cartridge tape player. 3,770,177, Cl. 226-194.000.

Dauben, Dwight L.: *See—*
Gilliam, James D.; and Dauben, Dwight L., 3,770,632.

Dautzenberg, Frits M.; Kouwenhoven, Herman W.; and Naber, Jaap E., to Shell Oil Company. Shaped acceptors for binding for removing sulfur oxides from flue gases and process for their manufacture. 3,770,647, Cl. 252-190.000.

Davis, Gordon Jerry, to Maytag Company, The. Valve construction. 3,770,001, Cl. 137-217.000.

Davis, John R.; and Krishna, Surinder, to Westinghouse Electric Corporation. High gain, low saturation transistor. 3,771,028, Cl. 317-235.00r.

Davis, Kan Bryan; and Zuber, Bretislav Paul, to Northern Electric Company, Limited. Registering of transversily corrugated elements. 3,769,677, Cl. 29-200.00p.

Davis, Stevens S.; and Cottam, Spencer, to Envirotech Corporation. Feedwell. 3,770,131, Cl. 210-519.000.

Davis, William D., to General Electric Company. Method and apparatus for analysis of impurities in air and other gases. 3,770,954, Cl. 250-41.0se.

Davy and United Engineering Company, Limited: *See—*
Ball, Allan; Stubbs, Dennis; and Richmond, William James, 3,770,103.

De Angelis, William M.; Luthmann, Reinhardt F.; Meehan, Charles A.; and Smith, M. Howe, to Technicon Instruments Corporation. Method of fabricating laboratory glassware. 3,770,405, Cl. 65-23.000.

De Cicco, Marie Augusta. Tire with safety indicator means. 3,770,040, Cl. 152-330.000.

De Good, Maynard J., to Rapistan, Incorporated. Accumulator with transport override. 3,770,102, Cl. 198-127.00r.

De Hart, Guy K.; De Hart, Louis K.; and Clark, Ruel R., to Marking Systems, Inc., mesne. Stencil-cutting apparatus. 3,770,093, Cl. 197-1.500.

De Hart, Louis K.: *See—*
De Hart, Guy K.; De Hart, Louis K.; and Clark, Ruel R., 3,770,093.

De Nova, Roberto, to Duplomatic S.p.A. Tracer valves for copying machines. 3,770,238, Cl. 251-3.000.

De Orazio, William R.: *See—*
Belady, Laszlo A.; De Orazio, William R.; and O'Neill, Robert W., 3,771,144.

De Paepe, James Richard: *See—*
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De Sorbo, Warren: *See—*
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De, Takanori: *See—*
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De Vos, Ferdinand Allard; and Ter Steege, Jan Hendrik, to N.V. Werkspoor-Amsterdam. Method and apparatus for controlling the engraving pattern of an electromagnetic gravure engraving. 3,770,888, Cl. 178-6.60b.

Dean, John J.: *See—*
Haydon, Arthur W.; and Dean, John J., 3,770,998.

Dear, Robert E. A.; and Woolf, Cyril, to Allied Chemical Corporation. Process for preparing fluorocarbon halides. 3,770,838, Cl. 260-653.000.

Deering Milliken Research Corporation: *See—*
Greene, Charles W.; and Varner, George C., 3,770,042.

Degener, Eberhard: *See—*
Gruber, Hermann; and Degener, Eberhard, 3,770,703.

Deily, Don, to City National Bank of Detroit and Fisher, Robert C., mesne. Tool control. 3,770,947, Cl. 235-151.110.

Delavan Manufacturing Company: *See—*
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Delfrate, Egidio Alvazzi, to Societa Italiana Telecomunicazioni Siemens S.p.A. Adjustable equalizer for wide-band transmission system. 3,771,071, Cl. 333-28.00r.

Demmler, Kurt: *See—*
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Dempco, Inc.: *See—*
Murphy, Vincent H., 3,770,299.

Dempsey, Robert H., to Neurodyne-Dempsey, Inc. Ground wire monitoring system. 3,771,098, Cl. 339-14.00r.

Demsky, Herbert M.; Dexter, Wilbur H.; Lever, Reginald F.; and Melzer, Paul A., to International Business Machines Corporation. Method for diffusing B or P into S: substrates. 3,770,521, Cl. 148-189.000.

DeNight, George G.; Farber, James F.; Glodek, John J.; and Higgins, Margaret D., to Scott Paper Company. Diaper system and absorbent pad therefor. 3,769,978, Cl. 128-287.000.

Depietro, Alfonso: *See—*
Kuehl, Guenther L.; and Depietro, Alfonso, 3,770,106.

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Derrien, Michel; van Landeghem, Hugo; JeanJean, Pierre; and Le Page, Jean Francois, to Institut Francais du Petrole des Carburants et Lubrifiants. Process for hydrocarbon purification by selective hydrogenation. 3,770,619, Cl. 208-255.000.

Desaki, Masayasu: *See—*
Mito, Akio; Desaki, Masayasu; Koike, Kunio; and Kikui, Shunji, 3,770,240.

Deschamps, Nicholas Howard; and Bernier, Gerald L., to Sanders Nuclear Corporation. Thermal super insulation. 3,769,770, Cl. 52-404.000.

Detroit Edison Company, The: *See—*
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Mashikian, Matthew S.; Kelley, James K.; and McMurray, William C., 3,770,877.

Dettling, Joseph R.; Farnham, John F., Jr.; and Gaines, Stephen T., to MB Associates. Intrusion detector. 3,771,152, Cl. 340-258.00c.

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Bogard, Adrian E.; and DeValleria, Robert E., 3,770,398.

Deveer, John Anton: *See—*
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Di Frank, Frank J.; and Greiwe, Daniel L., to Owens-Illinois, Inc. Corrugated board bundle stacker. 3,770,144, Cl. 214-60.00k.

Diana, William D.: *See—*
Wellman, William E.; Burton, Paul E.; and Diana, William D., 3,770,829.

Dick, Robert M., to Ciba-Geigy Corporation. Accelerated test method for determining coating adherence and ability to withstand corrosion. 3,770,593, Cl. 204-1.00t.

Dieley & Mueller, Inc.: *See—*
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Dietrich, Arnold K.; and Nott, William H., to Singer Company, The. Apparatus for switching inputs to a deflection system. 3,771,011, Cl. 315-26.000.

Dietrich, Karl-Heinz: *See*—
Ploch, Siegfried; Scholtis, Walter; Gerischer, Heini; Zschunee, Heinz; and Dietrich, Karl-Heinz, 3,769,815.

Digby, David W. Associative memory method of performing simultaneous content-searches. 3,771,139, Cl. 340-172.500.

Dinse, Wilhelm. Single-pole electrical connector. 3,771,099, Cl. 339-16.00r.

Dishcler, Helmut, to Novopress GmbH. Screw press. 3,769,905, Cl. 100-289.000.

Dittmann, Walter: *See*—
Hamann, Karl; Dittmann, Walter; Sunder-Plassmann, Paul; and Gorke, Klaus, 3,770,688.

Dixon, Dale D., to Air Products and Chemicals, Inc. Liquid halo-vinylic copolymers having hydroxyl functionality. 3,770,810, Cl. 260-486.00r.

Dlugos, Daniel F.; Freeman, Gerald C.; and Piotroshi, Peter N., to Pitney-Bowes, Inc. Parcel postage metering system. 3,770,945, Cl. 235-92.0ea.

Dobinson, Frank, to Monsanto Company. Aromatic polyamides containing 4,4-diamino-oxanilide moieties. 3,770,704, Cl. 260-78.00r.

Dobson, John W.: *See*—
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Dodson, Stanley Charles; and Hole, Kenneth Jmes, to British Petroleum Company Limited, The. Grease composition. 3,770,634, Cl. 252-29.000.

Dole, John S. Painting fastener. 3,769,730, Cl. 40-156.000.

Dolezal, Richard Joseph, to Sulzer Brothers Limited. Steam generator. 3,769,941, Cl. 122-406.00r.

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Dore, James E.; and Stauffer, William O., to Olin Corporation. Apparatus for cooling a stress sensitive continuous casting. 3,770,046, Cl. 164-283.000.

Dorffurt, Harald; and Pungs, Wolfgang, to Dynamit Nobel Aktiengesellschaft. Polyvinyl chloride molding compositions containing copolymer of vinyl chloride and fumaric acid diester for polymethacrylic acid alkyl ester, process, and articles. 3,770,676, Cl.260-23.0xa.

Dornseifer, Karl: *See*—
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Dorschner, Oskar; Gross, Hans-Werner; and Hartmann, Rainer, to Metallurgesellschaft Aktiengesellschaft. Polymerization of olefins. 3,770,714, Cl. 260-93.700.

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Dow Chemical Company, The: *See*—
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Dow Corning Corporation: *See*—
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Doyle, Collin M.; and Doyle, Wladzia G. Centrifugal countercurrent separator having bands covered with fluorocarbon sheets. 3,770,190, Cl. 233-15.000.

Doyle, Wladzia G.: *See*—
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Dozier, Hilliard, to U.S. Terminals, Inc. Hermetically sealed electrical terminal. 3,770,878, Cl. 174-153.00r.

Drehle, James R., to Hewlett-Packard Company. Switching circuit for inductive loads. 3,770,986, Cl. 307-270.000.

Dreier, Clarence R., Jr.: *See*—
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Dresser Industries, Inc.: *See*—
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Droughton, John; and Rhodes, Robin, to Isothermics Incorporated. Method for producing heat pipes. 3,769,674, Cl. 29-157.30r.

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Drukker, Alexander E., to Colgate-Palmolive Company. Process for preparing isomer of 2-chloro-11-(3-dimethylaminopropylidine) morphanthridine. 3,770,723, Cl. 260-239.00d.

Dryan, James J.: *See*—
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Dudragne, Raymond Andre. Device for lighting and examining a cavity. 3,770,342, Cl. 351-7.000.

Duffy, Michael C.; Schumann, Paul A., Jr.; and Yeh, Tsu-Hsing, to International Business Machines Corporation. Monolithic integrated circuits. 3,770,516, Cl. 148-33.000.

Dugan, Robert; and Boone, Shelby J., 20% interest to Lee, Raymond, Organization, Inc., The. Balloon launching apparatus with target indicating ring. 3,769,955, Cl. 124-16.000.

Dukette, William J., to American Associated Cybernetics, Inc. Sensor responsive cybernetics machine. 3,770,140, Cl. 214-1.0bb.

Dumasy, Christ J., to American Plasticraft Company. Multiplier assembly with air and material dielectric barriers. 3,771,024, Cl. 317-100.000.

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Dunn, James L., Jr., to Dow Chemical Company, The. Sample preparing apparatus. 3,769,934, Cl. 118-121.000.

Dunn, William M., to Federal-Mogul Corporation. Composite heavy-duty bushing and method of making the same. 3,770,332, Cl. 308-237.00r.

Dunning, Richard E., to Thermark Corporation. Hot stamp tape with etched carrier. 3,770,479, Cl. 117-3.400.

Dunphy, James Francis; Kreuz, John Anthony; and Roper, Don Albert, to Du Pont de Nemours, E. I., and Company. Interdiffusionally bonded structures of polyimide polymeric material. 3,770,573, Cl. 161-227.000.

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Dyar, Dillard F. Spray system. 3,770,203, Cl. 239-205.000.

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Earle, John Goddell: *See*—
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Eastham, John Frederick; and Bolton, Hugh Robert, to Tracked Hovercraft Limited. Linear induction motor. 3,770,995, Cl. 310-13.000.

Eastman Kodak Company: *See*—
Blood, Alden E.; and Statman, Max, 3,770,812.
Chechak, Jonas J., 3,770,638.
Fisher, John G.; and Coates, Clarence A., Jr., 3,770,719.
Gates, John Warburton, Jr.; and Salminen, Ilmari Fritiof, 3,770,431.
Harvey, Donald M., 3,770,441.
Jenkins, Philip W.; Heseltine, Donald W.; and Mee, John D., 3,770,451.

Oliver, Gene L., 3,770,757.
Weaver, Max A.; and Wallace, David J., 3,770,370.
Yungkurth, Donald G.; and McSweeney, Gary J., 3,770,432.

Eastman, Verne G. Wallet. 3,770,034, Cl. 150-38.000.

Eaton Corporation: *See—*
Franz, Rudolph J., 3,770,195.
Jackson, Harry Y.; Walker, Charles G.; and Ramoska, John, 3,770,086.
Jaeschke, Ralph L., 3,770,087.
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Ebregt, Johannes, to Akzo N.V. Process for preparing a concentrated collodial silicon dioxide solution. 3,770,650, Cl. 252-313.00s.

Ecodyne Corporation: *See—*
McKibben, James W.; Goodman, Brian L.; and Higgins, Robert B., 3,770,624.

Ecos Electronics Corporation: *See—*
Persidok, Jacek Antoni, 3,771,057.

Edele, Reinhard; and Kohler, Alfred, to SWF-Spezialfabrik fuer Autozubehoer Gustav Rau GmbH. Device for fastening a windshield wiper arm on a drive shaft. 3,769,654, Cl. 15-250.340.

Edme, Georges; Fichot, Robert; and Oberle, Georges, to Automobiles Peugeot and Regie Nationale des Usines Renault. Energy absorbing device and safety steering column for a vehicle equipped with the device. 3,769,851, Cl. 74-492.000.

Edwards, Harrison F.; and Bottorf, Stewart F., to Lewis Engineering Company, The. Photosensitive control apparatus with movable light control member. 3,770,965, Cl. 250-201.000.

Eisenhauer, John I.: *See—*
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Eisfeld, Wolfgang: *See—*
Nienburg, Hans Juergen; Eisfeld, Wolfgang; and Astheimer, Hans Joachim, 3,770,804.

Ekland, Phillip R., to United States of America, Air Force. Method of making an improved teflon-lined spherical bearing. 3,769,672, Cl. 29-149.50b.

Elab Corporation: *See—*
Kendall, Jerry A., 3,769,679.

Elder, Clarence L. Random unit generator amusement device. 3,770,269, Cl. 273-1.00e.

Elder, Gerald Brent; and Lewis, Armand Francis, to American Cyanamid Company. Composite laminate with a thin, perforated outer layer and cavitated bonded backing member. 3,770,560, Cl. 161-112.000.

Electrical Fittings Corporation: *See—*
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Brown, Leland A., 3,770,873.

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Electroprint, Inc.: *See—*
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Elgenstierna, Reinhold Magnus, to Tegelindustriens Centralkantor AB. Method for forming composite building. 3,770,863, Cl. 264-261.000.

Elingsen, Raymond L., to Brunswick Corporation. Integrated spark advance and carburetors valve control mechanism. 3,769,949, Cl. 123-99.000.

Elkins, Lujene, to Bunker Ramo Corporation. Electronic circuit assemblies and method of manufacture. 3,771,101, Cl. 339-17.00c.

Elliott Brothers (London) Limited: *See—*
Laverick, Elizabeth, 3,771,160.

Elton, Robert L., to Minnesota Mining and Manufacturing Company. Method for preparing a microporous sheet by heat-farming, annealing and leaching. 3,770,537, Cl. 156-77.000.

Eltra Corporation: *See—*
Cronce, Grant Woodrow, 3,771,113.

Emerson Electric Co.: *See—*
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Emmons, William D.; and Swift, Graham, to Rohm and Haas Company. Esters of sulfo-benzoic and phthalic acid. 3,770,801, Cl. 260-470.000.

Enders, Ray H.: *See—*
Brenneman, J. Edward; and Enders, Ray H., 3,770,950.

Endler, Walter: *See—*
Maier, Eberhard; Endler, Walter; and Haack, Paul, 3,770,217.

Endo, Takaya: *See—*
Sato, Shui; Hanzawa, Teruo; Furuya, Masaaki; Endo, Takaya; and Inoue, Isaburo, 3,770,446.

Engeler, William E.; and Tiemann, Jerome J., to General Electric Company. Self-registered surface charge launch-receiver device and method for making. 3,770,988, Cl. 307-304.000.

Engelhard, William E., to Owego Heat Treat, Inc. Thermally activated control system. 3,770,194, Cl. 236-15.00b.

Engler, Clifford E., to Gilwin Corporation, mesne. Display apparatus for vehicle wheels. 3,769,729, Cl. 40-129.00b.

Enomoto, Satoru; Wada, Hisayuki; Fujioka, Mikio; and Koguro, Masao, to Kureha Kagaku Kogyo Kabushiki Kaisha. Hardner composition for urethane resin. 3,770,645, Cl. 252-182.000.

Enterante, Frank V. Mixing valve. 3,770,017, Cl. 137-625.170.

Envirotech Corporation: *See—*
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Epstein, Marvin A.: *See—*
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Gams, Erwin; Namenyi, Istvan; Wahlig, Helmut; Erdmann, Dietrich; and Koch, Wolfgang, 3,770,817.

Erickson, Clifford W., to Honeywell Inc. Omnidirectional ultraviolet radiation detector. 3,771,005, Cl. 313-101.000.

Ernest, Richard B., to Penn Engineering & Manufacturing Corporation. Self-clinching stud with a modified head. 3,770,037, Cl. 151-41.730.

Esaki, Shigenobu: *See—*
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ESB Incorporated: *See—*
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Bergum, Bernard C.; Bilhorn, John M.; Kenyon, Kenneth H.; Macaulay, William R.; and Youngquist, John A., 3,770,505.
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Raddi, William J.; Kligerman, Jerome L.; and Herrmann, Cal C., 3,769,965.

Esbenshade, Aaron M., Jr. Intermittent positive pressure breathing apparatus. 3,769,973, Cl. 128-145.800.

Esso Production Research Company: *See—*
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Esso Research and Engineering Company: *See—*
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Hubbard, Addison W.; Powers, Kenneth W.; and O'Farrell, Charles P., 3,770,682.
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Mertzweiller, Joseph K.; and Tenney, Horace M., 3,770,844.
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Roper, Robert; and Rowe, Charles A., Jr., 3,770,702.
Tegge, Bruce R.; and Rosenbaum, Barry M., 3,770,709.
Wellman, William E.; Burton, Paul E.; and Diana, William D., 3,770,829.

Etablissements Hutchinson-Compagnie Nationale du Caoutchouc: *See—*
Canat, Christian, 3,770,481.

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Ethyl Corporation: *See—*
Lawrence, Walter W., Jr.; Mc Kay, Tom W.; and Wiegand, Karl E., 3,770,796.
Shepherd, Lawrence H., Jr., 3,770,840.

Ethyl Corporation of Canada Limited: *See—*
Mueller, Gunter H., 3,770,208.

Ettel, Robert, to Mende, Wilhelm & Co. Tensioning device for wide moving belts. 3,770,108, Cl. 198-208.000.

Eubanks, Floyd G. Apparatus for attaching terminals to electric conductors. 3,769,681, Cl. 29-203.00d.

Evans, Joseph H.; and Will, Gareth W., to Reychem Corporation. Wraparound closure sleeve. 3,770,556, Cl. 161-39.000.

Evans, Milton L.: *See—*
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Evans, Robert R., to Alden Self-Transit Systems Corporation. Transit monitoring system. 3,771,119, Cl. 340-23.000.

Everett, Jack E.: *See—*
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Evode Limited: *See—*
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Exomet, Incorporated: *See—*
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Faber, Saul L.: *See—*
Faber, Saul L.; and Jurek, Dennis J. (said Jurek assor. to said), 3,770,308.

Faber, Saul L.; and Jurek, Dennis J., said Jurek assor. to said Faber, Saul L. Golf ball retriever. 3,770,308, Cl. 294-19.00a.

Faires, Tony D.; and Balkin, Larry M., to Container Corporation of America. Container closure structure. 3,770,187, Cl. 229-39.00r.

Falanga, Anthony J.: *See—*
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Falconieri, Remo: *See—*
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Fallacaro, Emmanuele: *See—*
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Fannin, Armand A., Jr.: *See—*
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Fanshawe, William J.; and Safir, Sidney Robert, to American Cyanamid Company. Cyclopropyl-1,2,4-oxadiazolylpyrazines. 3,770,739, Cl. 260-250.000.

Fantl, Joel: *See—*
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Farah Manufacturing Company, Inc.: *See—*
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Farcilli, Andre: *See—*
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Farnam, F.D., Co.: *See—*
Farnam, Robert G., 3,770,480.
Farnam, Robert G., to Farnam, F.D., Co. Method of making coated gaskets. 3,770,480, Cl. 117-4.000.
Farnham, John F., Jr.: *See—*
Dettling, Joseph R.; Farnham, John F., Jr.; and Gaines, Stephen T., 3,771,152.
Farrah, Harry Robert, to Bendix Corporation, The. Method and apparatus for imaging stationary and moving objects. 3,771,116, Cl. 340-5.00h.
Farrar, Jack R.: *See—*
Pachmayr, Frank A.; and Farrar, Jack R., 3,769,731.
Fatt, Irving; and Kitrilakis, Sotiris. Conjunctival device. 3,769,961, Cl. 128-2.00t.
Faust, Werner; Beriger, Conrad; and Bossi, Hans Jurg, to Aktiengesellschaft Brown, Boveri & Cie. Pulse transformer for controlled rectifier. 3,771,042, Cl. 321-11.000.
Favre, Francois: *See—*
Bossard, Werner; and Favre, Francois, 3,770,371.
Favstritsky, Nicolai Alexander; and Stautzenberger, Adin L., to Celanese Corporation. Hydrogenolysis of beta-hydroxy carboxylic acid lactones. 3,770,837, Cl. 260-635.00d.
Fayling, Clarence D.; Van Horn, John W.; and Ray, Philip M., to Rockwell International Corporation. Parking meter assembly. 3,770,090, Cl. 194-1.00b.
Federal-Mogul Corporation: *See—*
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Ladin, Eli M., 3,770,991.
Feichtinger, Gerhard; and Skatsche, Othmar, to List, Hans. Cylinder head for a water-cooled internal combustion engine. 3,769,948, Cl. 123-41.310.
Fein, Marvin M.: *See—*
Barabas, Eugene S.; and Fein, Marvin M., 3,770,683.
Feit, Eugene David: *See—*
Bartlet, John Lester; and Feit, Eugene David, 3,770,433.
Fekete, Lajos F.; and Peetoom, Frans, to Baxter Laboratories, Inc. Clarification of blood serum and plasma. 3,770,631, Cl. 210-53.000.
Feldman, Charles F.: *See—*
Henry, Raymond M.; and Feldman, Charles F., 3,770,572.
Feller, Gilbert, to Metalem S.A. Method for attaching applique or applied chapters formed of metal and equipped with circular-cylindrical foot portion to a dial. 3,769,676, Cl. 29-177.000.
Felten & Guilleaume Kabelwerke Aktiengesellschaft: *See—*
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Oswitch, Stanley; and Kipp, Kevin K., 3,770,690.
Fertig, Glenn Howard, to Mine Safety Appliances Company. Nondispersive infrared fluid analyzer with compensation for absorptive and mechanical effects of ambient conditions. 3,770,974, Cl. 250-344.000.
Fertik, Harry A.; and Ross, Charles W., to Leeds & Northrup Company. Method for automatic control with time varying tuning. 3,770,946, Cl. 235-150.100.
Fiat Societa per Azioni: *See—*
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Roggero, Alberto, 3,771,036.
Fichot, Robert: *See—*
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Fidelity Electric Co., Inc.: *See—*
Harter, Earl F., 3,771,046.
Fiedler, Horst; Fricker, Ludwig; and Renz, Willi, to Daimler-Benz Aktiengesellschaft. Installation for venting a fuel tank of a motor vehicle provided with expansion tank. 3,769,952, Cl. 123-136.000.
Field, Nathan D.; and Daniels, Wiley Edgar, to GAF Corporation. Terpolymer latices based on vinyl ether/vinyl chloride copolymers grafted with acrylate esters. 3,770,851, Cl. 260-884.000.
Fierro Esponja, S.A.: *See—*
Celada, Juan; Mackay, Patrick W.; Garcia, Gilberto Guerra; Martinez, Enrique R.; and Villasenor, Antonio, 3,770,421.
Filachione, Edward M.: *See—*
Luvisi, Fred P.; Filachione, Edward M.; and Hopkins, William J., 3,770,372.
Filin, Leonid Alexandrovich: *See—*
Pavlov, Jury Vasilievich; Petrov, Alexandr Aleseevich; Nikolsky, Viktor Alexandrovich; Chunyaeva, Raisa Ivanovna; and Filin, Leonid Alexandrovich, 3,769,820.
Filters International, Inc.: *See—*
White, Eugene B., 3,770,127.
Finley, John W., to United States of America, Agriculture. Beverages containing deamidized gluten. 3,770,452, Cl. 426-190.000.
Finney, Herschel D., to Phillips Petroleum Company. Submerged storage vessel. 3,769,803, Cl. 61-46.500.
Firestone Tire & Rubber Company, The: *See—*
Futamura, Shingo; and Bouton, Thomas Chester, 3,770,710.
Fischer, Adolf: *See—*
Kiehs, Karl; Koenig, Karl-Heinz; and Fischer, Adolf, 3,770,779.
Fischer, Herbert, to Clarke Chapman-John Thompson Limited. Overhead cranes. 3,770,136, Cl. 212-10.000.
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Fisher, John G.; and Coates, Clarence A., Jr., to Eastman Kodak Company. 2-Amino-4-(azoyl)-azo-thiazole compounds and quaternary derivative thereof. 3,770,719, Cl. 260-158.000.
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Fisons Limited: *See—*
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Parsons, John Henry, 3,770,754.
Fitzgerald, William M. B., to Johnson Matthey and Mallory, Ltd. Manufacturing of composite materials. 3,769,828, Cl. 72-450.000.
Fitzgerald, William M. B., to Johnson Matthey and Mallory, Ltd. Manufacture of composite materials. 3,770,015, Cl. 137-624.110.
Flanagan, James P.; and Carter, Jack L. Liquid separator system and apparatus. 3,769,999, Cl. 137-183.000.
Fleischer, Henry. Automatic car sand blaster. 3,769,753, Cl. 51-11.000.
Fleischer, Robert L.; and Walker, Robert M., to General Electric Company. Radiation detection method. 3,770,962, Cl. 250-473.000.
Fleissner, Heinz, to Vepa AG. Process for the continuous steam treatment of staple fiber. 3,770,374, Cl. 8-149.300.
Fleming, John W., Jr.; and McMullen, James Michael. Web sampling method and apparatus. 3,769,829, Cl. 73-1.000.
Flexible Metal Hose Manufacturing Company: *See—*
Hallett, Tom E., 3,770,303.
Flexicore Co., Inc., The: *See—*
Shoe, Theodore W., 3,770,360.
Flider, Frank S., to Justrite Manufacturing Company, The. Safety disposal can for inflammable materials. 3,770,160, Cl. 220-36.000.
Florens, Nicholas, Jr., 1/3 each to Oakden, Julia and Oakden, Tina M., mesne. Garment construction. 3,769,634, Cl. 2-90.000.
Flournoy, Norman E.; and Kersey, John P., to Texaco Inc. Odometer. 3,769,711, Cl. 33-141.00g.
Flowers, Dervin L., to Teledyne Semiconductor, a division of Teledyne, Inc. Passivating solution and method. 3,770,498, Cl. 117-219.000.
Floyd, Paul H.; and Binczewski, George J., to Kaiser Aluminum & Chemical Corporation. Process for recovery of aluminum from furnace skim. 3,770,424, Cl. 75-68.00r.
Fluor Corporation: *See—*
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Fluoroware, Inc.: *See—*
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Folkins, Glenn O., to United States of America, Atomic Energy Commission. Contact fuse. 3,769,911, Cl. 102-7.400.
Ford Motor Company: *See—*
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Forgione, Peter Salvatore, to American Cyanamid Company. Novel carbonyl polymers. 3,770,700, Cl. 260-64.000.
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Forsyth, John P.; Forsyth, Robert W.; Holcomb, Donald R.; and Shiovitz, Nathan N., to Lockheed Aircraft Corporation. Modular firefighting unit. 3,770,060, Cl. 169-24.000.
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Forsyth, John P.; Forsyth, Robert W.; Holcomb, Donald R.; and Shiovitz, Nathan N., 3,770,060.

Fortmann, Manfred, to Interatom, Internationale Atomreaktorbau GmbH. Monitoring device for reversible blow-out disc. 3,770,918, Cl. 200-61.080.

Foseco International Limited: *See*—
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Foster, Fred M., to Airco, Inc. Carcass chilling facility. 3,769,807, Cl. 68-63.000.

Fovall, Nettie L. Caddy for handled appliance. 3,770,234, Cl. 248-117.700.

Fox, Donnell H., to Robertshaw Controls Company. Replacement control knob. 3,769,933, Cl. 116-124.20a.

Frach, Werner: *See*—
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Frangquist, Gustav Herbert, to Combustion Engineering, Inc. Swing back whizzer blades for mechanical air separator. 3,770,124, Cl. 209-139.00a.

Franz, John E., to Monsanto Company. Herbicidal method employing arylthiohydramic acids. 3,770,412, Cl. 71-98.000.

Franz, Rudolph J., to Eaton Corporation. Temperature control system and vacuum modulator valve therefor. 3,770,195, Cl. 236-13.000.

Freakes, Anthony: *See*—
Miller, Joseph A.; Kruglinski, Frank A.; and Freakes, Anthony, 3,769,777.

Frederiksen, Ronald A.: *See*—
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Freeman, Gerald C.: *See*—
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Freireich, Ernest; and Klooster, Henry J., to Fluor Corporation. Treatment of wet natural gas mixtures to recover liquid hydrocarbons. 3,770,622, Cl. 208-340.000.

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French, Floyd R.: *See*—
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Freney, Ethel Mae. Sanitary napkin. 3,769,979, Cl. 128-290.00r.

Fricker, Ludwig: *See*—
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Fried. Krupp Gesellschaft mit beschrankter Haftung: *See*—
Hirschfelder, Horst-Dieter; and Marzinkewitsch, Rene, 3,770,025.

Friedman, Jon H., to Iowa State University, Research Foundation. End point control of upper extremity orthotic brace using head orientation. 3,769,636, Cl. 3-1.100.

Friedrick, Peter, to Vaillant, Joh., KG. Rotary gas control with a thermoelectric ignition safety device and piezoelectric igniter. 3,770,363, Cl. 431-47.000.

Frielingsdorf, Helmut: *See*—
Levacher, Friedrich; Dornseifer, Karl; Nolting, Karl-Heinz; Frielingsdorf, Helmut; and Kirch, Hans-Joachim, 3,771,069.

Friend, William Harold. Spin-stabilized projectiles. 3,769,912, Cl. 102-93.000.

Frings, Horst; Braun, Gunter; Mosle, Ernst; and Schmid, Ludwig, to Daimler-Benz Aktiengesellschaft. Wrench, especially torque wrench. 3,769,860, Cl. 81-52.500.

Fritz, Andre, to Du Pont de Nemours, E. I., and Company. Aryleneisopropylidene copolymers. 3,770,661, Cl. 260-2.00r.

Froehlich, Alfred, to Ciba-Geigy AG. Photographic silver halide light-sensitive material containing azo dyes. 3,770,444, Cl. 96-99.000.

Frohmader, Karl-Peter: *See*—
Burtscher, Joachim; Frohmader, Karl-Peter; Porst, Alfred; and Voss, Peter, 3,771,029.

Fryzel, Ronald A., to Detroit Edison Company, The. Structure for and method of automatic balancing of a rotating member. 3,769,854, Cl. 74-573.000.

Fuchs, Alfred; and Gafvert, Bo E., to AB Tetra Pak. Method of splicing two laminated packaging materials together. 3,770,540, Cl. 156-157.000.

Fugman, Robert L.; and Jezuit, Leslie J., to Rockwell International Corporation. . 3,769,909, Cl. Wet nip dampener.

Fuji Jyukogyo Kabushiki Kaisha: *See*—
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Fuji Photo Film Co., Ltd.: *See*—
Kawano, Hideo; Kato, Hirotetu; and Tsuji, Nobuo, 3,770,450.
Osada, Chiaki; Satomura, Masato; and Ono, Hisatake, 3,770,443.
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Fujii, Naoharu; Tsukamoto, Kenkichi; Yamamoto, Momi; and Iijima, Fumiko. Electrostatic treatment apparatus with charge disperal means. 3,769,985, Cl. 128-419.00r.

Fujimoto, Osamo, to Tokai Denka Kogyo Kabushiki Kaisha. Method of etching copper and alloys thereof. 3,770,530, Cl. 156-3.000.

Fujioka, Mikio: *See*—
Enomoto, Satoru; Wada, Hisayuki; Fujioka, Mikio; and Koguro, Masao, 3,770,645.

Fujitsu Limited: *See*—
Nagahori, Tetuo; and Kanda, Kaoru, 3,771,125.
Toba, Teruo; and Umeda, Shozo, 3,771,016.

Fujiwhara, Mitsuto; Sato, Ryosuke; Koga, Tadaaki; and Matsuo, Shunji, to Konishiroku Photo Industry Co., Ltd. Process for forming cyan image in light-sensitive color photographic material. 3,770,436, Cl. 96-56.500.

Fukada, Tadayuki: *See*—
Ueki, Shiro; Fukada, Tadayuki; and Miyata, Yoshimitsu, 3,770,663.
Ueki, Shiro; and Fukada, Tadayuki, 3,770,856.

Fukui, Hatsuaki: *See*—
Chen, Yen-Sun; Fukui, Hatsuaki; Gordon, Eugene Irving; Krupka, Dan Charles; and Rowen, John Howard, 3,771,008.

Fukushima, Yoshio, to Ricoh Co., Ltd. Light source system for overhead projectors. 3,770,344, Cl. 353-38.000.

Funkumura, Takashi, to Toray Industries, Inc. Process for preparing l-lysine. 3,770,585, Cl. 195-29.000.

Furlong, Dale A.; and Schmid, Alan H., to Combustion Power Company, Inc. Fluid bed reactor pre-heating method and apparatus. 3,769,922, Cl. 110-28.00j.

Furuta, Akio: *See*—
Ozaki, Atsumu; Aika, Ken-Ichi; Furuta, Akio; and Okagami, Akio, 3,770,658.

Furuya, Masaaki: *See*—
Sato, Shui; Hanzawa, Teruo; Furuya, Masaaki; Endo, Takaya; and Inoue, Isaburo, 3,770,446.

Futamura, Shingo; and Bouton, Thomas Chester, to Firestone Tire & Rubber Company, The. Bulk polymerization of diolefins. 3,770,710, Cl. 260-83.700.

Gabel, Thomas H.: *See*—
Zernov, Peter; and Gabel, Thomas H., 3,770,142.

Gabor, Kalman B. Fine grinding device. 3,770,214, Cl. 241-42.000.

Gach, Peter P.; and Leonard, Henry K., to Sunbeam Plastics Corporation. Safety closure. 3,770,153, Cl. 215-9.000.

GAF Corporation: *See*—
Barabas, Eugene S.; and Fein, Marvin M., 3,770,683.
Field, Nathan D.; and Daniels, Wiley Edgar, 3,770,851.
Mestetsky, Thomas S., 3,770,677.
Mestetsky, Thomas S., 3,770,687.
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Gafvert, Bo E.: *See*—
Fuchs, Alfred; and Gafvert, Bo E., 3,770,540.

Gaines, Stephen T.: *See*—
Dettling, Joseph R.; Farnham, John F., Jr.; and Gaines, Stephen T., 3,771,152.

Galaske, Folker, to International Standard Electric Corporation. Printing apparatus utilizing magnetic selection of type levers from a continuously rotating magazine. 3,770,094, Cl. 197-18.000.

Galauner, Bela: *See*—
Kapolyi, Laszlo; Lazar, Ferenc; Vamos, Gyorgy; and Galauner, Bela, 3,770,469.

Gallagher, Terence J.: *See*—
Dougherty, Lawrence W.; and Gallagher, Terence J., 3,770,289.

Galloway, Peter, to Angus, George, & Company, Limited. Shaft and line seals. 3,770,284, Cl. 277-92.000.

Gams, Erwin; Namenyi, Istvan; Wahlig, Helmut; Erdmann, Dietrich; and Koch, Wolfgang, to Merck Patent Gesellschaft mit beschrankter Haftung. Alkylaminoalkylsulfinic acid salts. 3,770,817, Cl. 260-513.700.

Garabedian, Taniel A., to Monsanto Company. Stabilization of pentachlorophenol. 3,770,835, Cl. 260-623.00r.

Garcia, Gilberto Guerra: *See*—
Celada, Juan; Mackay, Patrick W.; Garcia, Gilberto Guerra; Martinez, Enrique R.; and Villasenor. Antonio, 3,770,421.

Gardner, Phillip J.: *See*—
Silver, H. Graham; Heller, Adam; Gardner, Phillip J.; and Argue, Gary R., 3,771,009.

Garner, Howell D.; and Hellbaum, Richard F., to United States of America, National Aeronautics and Space Administration. Fluid pressure amplifier and system. 3,770,021, Cl. 137-819.000.

Garnett, Donald W., to Mahogany Farms, Inc., mesne. Method of shaping and compacting material. 3,770,458, Cl. 264-294.000.

Garrett Corporation, The: *See*—
Avant, William W., 3,769,998.

Garrity, Paul G.: *See*—
Court, Patrick R. J., 3,770,367.

Gasc, Jean-Claude; and Bucourt, Robert, to Roussel-UCLAF. 17 Beta-cyano-unsaturated steroids, process and therapeutic method. 3,770,725, Cl. 260-239.500.

Gast, David Barend, to Lever Brothers Company. Process for preparing skinless dry sausage and product produced thereby. 3,770,459, Cl. 426-8.000.

Gastrock, William Henry, to American Cyanamid Company. Process for the preparation of 2-amino-5-(5-nitroimidazol-2-yl)-1,3,4-thiadiazoles. 3,770,760, Cl. 260-306.0sd.

Gates, John Warburton, Jr.; and Salminen, Ilmari Fritiof, to Eastman Kodak Company. Photographic elements containing ballasted resorcinols. 3,770,431, Cl. 96-29.00d.

Gath, Rudolph H.: *See*—
Zelinski, Robert P.; Short, James N.; Gath, Rudolph H.; and Zuech, Ernest A., 3,770,713.

Gatti, Giancarlo, to Honeywell Information Systems Italia. Card feeder. 3,770,265, Cl. 271-10.000.

Gaudio, Joseph G., to United States of America, Air Force. Stripline-to-two-conductor balun. 3,771,070, Cl. 333-26.000.

Gavillet, Charles R.; Hagmeier, Dale L.; and Harris, Gregory K. Molded handle for impact tools. 3,770,033, Cl. 145-61.00c.

Gebr. Knauf Westdeutsche Gipswerke: *See*—
Knauf, Alfons; Hartmann, Peter; Schmidt, Adolf; and Wirsching, Franz, 3,770,468.

Gechele, Walter; and Pasini, Arnaldo, to Olivetti, Ing., C., & C., S.p.A. Data processing system for handling the flow of merchandise articles or services on a plurality of selling points. 3,770,941, Cl. 235-61.70r.

Gehlhaus, Paul H.: *See*—
Walker, Robert W.; and Gehlhaus, Paul H., 3,770,524.

Gehring, Christoph W.; Scholz, Egbert; and Strauss, Wolfgang, to Maschinenfabrik Gehring K.G. Tool for mechanically and electrochemically machining the surface of metallic workpieces. 3,770,610, Cl. 204-217.000.

Geimer, Allen F. J.: *See*—
Spain, Theodore H.; Geimer, Allen F. J.; and Loesche, Victor E., Jr., 3,769,742.

Gelendwellenbau GmbH: *See*—
Schultenkamper, Josef, 3,770,993.

General Corporation, The: *See*—
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General Corrugated Machinery Co., Inc.: *See*—
Miller, Joseph A.; Kruglinski, Frank A.; and Freakes, Anthony, 3,769,777.

General Dynamics Corporation: *See*—
Colburn, Steven C.; McPherson, Charles Q.; and Miller, Roger A., 3,770,335.

General Electric Company: *See*—
Amra, Lutfi H., 3,770,392.
Bean, Charles P.; and De Sorbo, Warren, 3,770,532.
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Engeler, William E.; and Tiemann, Jerome J., 3,770,988.
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Graff, William A.; and Kohut, Jaroslaw, 3,770,568.
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Holub, Fred F.; Berger, Abe; and Hardman, Bruce B., 3,770,768.
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General Foods Corporation: *See*—
Makwinski, John A.; Rehman, Warren C.; and Spotholz, Clifford H., 3,770,457.
McSweeney, Daniel Robert; and Kandi, John Richard, 3,770,463.
Tolf, Ingvar L.; Herzing, Vernon J.; Miller, Everett L.; and Lightfoot, George L., 3,770,141.

General Kinematics Corporation: *See*—
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General Lock Company: *See*—
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General Mills, Inc.: *See*—
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General Motors Corporation: *See*—
Brooks, Frank W.; and Sebring John G., 3,770,082.
Childress, Richard; and Kemper, John A., Jr., 3,770,546.
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Hammer, Kenneth C., 3,770,294.
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Genson, Samuel Richard: *See*—
Petersen, Svend Aage; and Genson, Samuel Richard, 3,770,402.

Gentex Corporation: *See*—
Kania, Albert T.; and Jerominek, Joseph, 3,769,755.

Geominy, Louis Joseph Henri, to U.S. Philips Corporation. Method of securing end contacts to cables. 3,769,703, Cl. 29-628.000.

Georgia-Pacific Corporation: *See*—
Jespersen, Paul W., 3,770,222.

Gerard, Paul, to Societe Generale d'Entreprises. Thermal power station. 3,769,943, Cl. 122-510.000.

Gerin, Merlin, mesne: *See*—
Lorinet, Jean-Paul Philippe; Lagier, Francois; and Bobineau, Bernard, 3,769,914.

Gerischer, Heini: *See*—
Ploch, Siegfried; Scholtis, Walter; Gerischer, Heini; Zschunee, Heinz; and Dietrich, Karl-Heinz, 3,769,815.
Ploch, Siegfried; Zeisberg, Peter; Gerischer, Heini; Hennig, Siegfried; Linack, Manfred; and Klinger, Kurt, 3,769,816.

Gerow, Clare William; and Sparapany, John Joseph, to Du Pont de Nemours, E. I., and Company. Interdiffusionally bonded structures of polyimide and fluoropolymer. 3,770,566, Cl. 161-189.000.

Getz, Gary R.: *See*—
Ireland, Newell J.; and Getz, Gary R., 3,770,858.

Gewerkschaft Eisenhutte Westfalia: *See*—
Hauschopp, Alois, 3,770,321.

GFM Gesellschaft fur Fertigungstechnik und Maschinenbau Aktiengesellschaft: *See*—
Kralowetz, Bruno; Braunwieser, Johann; and Reznar, Josef, 3,769,825.

Giachetti, Alfredo: *See*—
Pieracci, Angiolo; and Giachetti, Alfredo, 3,769,814.

Gibney, Lloyd W., to American Optical Corporation. Extrusion die. 3,770,357, Cl. 425-131.000.

Gibson, James O.; Schumacher, Robert L.; and Gore, Thomas W., to McDonnell Douglas Corporation. Refractory composites. 3,770,487, Cl. 117-46.0ca.

Gilak, Ahmad: *See*—
Sautter, Werner; and Gilak, Ahmad, 3,770,600.

Gilbert, Alfred R.: *See*—
Bostick, Edgar E.; and Gilbert, Alfred R., 3,770,696.

Gilbert, Ronald E., to Gulf Research & Development Company. Article coated with fluorinated polymer. 3,770,493, Cl. 117-132.0cf.

Gilbu, Agnar, to Vera Fabrikker A/S. Method for producing tubes of reinforced setting plastic material. 3,770,541, Cl. 156-173.000.

Gill, Raymond E.; and McMahon, Floyd J., to Westinghouse Air Brake Company. Skid supported cutting blade. 3,770,065, Cl. 172-4.500.

Gillemot, George W.: *See*—
Thompson, John T.; and Gillemot, George W., 3,771,112.

Gilliam, James D.; and Dauben, Dwight L., to Amoco Production Company. Micellar fluids for injection well stimulation and oil recovery. 3,770,632, Cl. 252-8.55d.

Gilliatt, Charles L., to Raytheon Company. Dielectric heating apparatus for tires. 3,770,931, Cl. 219-10.570.

Gilwin Corporation, mesne: *See*—
Engler, Clifford E., 3,769,729.

Girling Limited: *See*—
Harries, David Anthony, 3,769,801.
Hill, Albert Charles, 3,770,084.
Newstead, Charles; and Wright, Andrew Charles Walden, 3,770,083.
Spence, Douglas Roy, 3,770,325.
Vogt, Hans Josef, 3,770,326.

Gladstone, Matthew T.; and Malloy, John F., to Norton Company. Partically cured preformed film and its use in joining overlapped ends of a coated abrasive article. 3,770,555, Cl. 161-36.000.

Glass, Marvin, & Associates: *See*—
Breslow, Jeffrey D., 3,770,276.

Glasurit-Werke M. Winkelmann GmbH: *See*—
Thiele, Guenther, 3,770,122.

Glenn, Harry D., to Buckeye Steel Castings Company. Car body center brace and center plate. 3,770,139, Cl. 213-57.000.

Globe-Union, Inc.: *See*—
Weissman, Eugene Yehuda; McDonald, Guy Douglas; and Weinlein, Conrad Eugene, 3,770,507.

Glodek, John J.: *See*—
DeNight, George G.; Farber, James F.; Glodek, John J.; and Higgins, Margaret D., 3,769,978.

Gloor, Karl; and Halter, Eugen, to Schweissindustrie Oerlikon Buhrle AG. Methods and means for monitoring eccentricites of coaxial members. 3,770,959, Cl. 250-375.000.

Godin, Jacques J.; and Stephan, Jacques A. Apparatus for leveling the decks of ships. 3,770,256, Cl. 266-44.00f.

Goebels, Siegmund E.: *See*—
Szettler, Ernst; and Goebels, Siegmund E., 3,769,897.

Goffe, William L.; Jones, Bruce A.; and Blackert, John E., to Xerox Corporation. Apparatus for splitting a softenable film comprising bite rollers. 3,770,554, Cl. 156-510.000.

Goksel, Mehmet Adnan, to Michigan Technological University, Board of Control of. Treatment of zinc rich steel mill dusts for reuse in steel making processes. 3,770,416, Cl. 75-25.000.

Golahny, Yehuda; and Gwinn, David A. Reactance measurement apparatus. 3,771,050, Cl. 324-57.00r.

Goldberg, Lawrence S.; and Schnur, Joel M., to United States of America, Navy. Tunable internal-feedback liquid crystal-dye laser. 3,771,065, Cl. 331-94.501.

Goldenberg, Marcel: *See*—
Lake, James L.; Litz, John E.; Coleman, Robert B.; Goldenberg, Marcel; and Vojkovic, Milos, 3,770,414.

Goldman, Irvino M., to Pfizer Inc. 1,3-Dimethyl-1,2,3,4-tetrahydroheterocyclo [x,y-f]purine-2,4-diones. 3,770,741, Cl. 260-256.000.

Goldman, Leon; and Rockwell, R. James, Jr. Instrument for performing laser micro-surgery and diagnostic transillumination of living human tissue. 3,769,963, Cl. 128-2.00r.

Goldring, John Elmer, to Agro International. Plant watering device. 3,769,748, Cl. 47-38.100.

Goldschmidt, Th., A.G.: *See*—
Ruf, Erich, 3,770,853.

Goltermann, Wandel u.: *See*—
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Goodman, Brian L.: *See*—
McKibben, James W.; Goodman, Brian L.; and Higgins, Robert B., 3,770,624.

Goodman Equipment Corporation, mesne: *See*—
Boskovitch, Peter P., 3,770,110.

Goodman, Jack P. Pressurized cable system with lower pressure splice case. 3,770,871, Cl. 174-11.00r.

Goodrich, B. F., Company, The: *See*—
Kramer, James H., 3,770,291.
Porter, John P.; and Karper, Paul W., 3,769,830.

Goodyear Tire & Rubber Company, The: *See*—
Casey, William R., 3,769,856.
Post, Herman B., 3,770,876.
Ruof, Edgar J., 3,770,327.
Wolfe, Merritt W., 3,770,038.

Goodyear Tire and Rubber Company, The: *See*—
Abbott, John R., 3,770,041.

Gordini, Silvano; and Noe, Sergio, to Snam Progetti S.p.A. Apparatus for treating viscous liquids. 3,770,252, Cl. 259-107.000.

Gordon, Eugene Irving: *See*—
Chen, Yen-Sun; Fukui, Hatsuaki; Gordon, Eugene Irving; Krupka, Dan Charles; and Rowen, John Howard, 3,771,008.

Gordon, Robert Cornelius, Jr., to Calgon Corporation. Glassy silicate corrosion inhibitor with controlled solution rate. 3,770,652, Cl. 252-287.000.

Gordon, Robert W. Compressor lubrication apparatus for closed reversible cycle ice-making systems. 3,769,812, Cl. 62-352.000.

Gore, Thomas W.: *See*—
Gibson, James O.; Schumacher, Robert L.; and Gore, Thomas W., 3,770,487.

Gorke, Klaus: *See*—
Hamann, Karl; Dittmann, Walter; Sunder-Plassmann, Paul; and Gorke, Klaus, 3,770,688.

Gough, Stanely T. D.: *See*—
Billet, James; and Gough, Stanely T. D., 3,770,756.

Gould, Inc.: *See*—
Sabatino, Anthony, 3,770,510.

Gozzo, Franco; and Carraro, Giorgio. Oxyperfluoromethylene polymers. 3,770,823, Cl. 260-535.00h.

Grace, W. R., & Co.: *See*—
Blazer, James J., 3,770,615.

Graff, William A.; and Kohut, Jaroslaw, to General Electric Company. Glass seals. 3,770,568, Cl. 161-193.000.

Graham, James J., to Badger Company, Inc., The. Explosion and fire suppression system for catalytic reactors. 3,770,059, Cl. 169-1.00a.

Graham, Stanley: *See*—
Steels, Gordon; and Graham, Stanley, 3,770,358.

Grant, Norman H.: *See*—
Alburn, Harvey E.; and Grant, Norman H., 3,770,771.

Granzow, Wayne G., to Armco Steel Corporation. Deep drawing method. 3,769,824, Cl. 72-41.000.

Grassmayr, Klaus: *See*—
Bretschneider, Hermann; Grassmayr, Klaus; Hohenlohe-Oehringen, Kraft; and Grussner, Andre, 3,770,761.

Graven, Richard G., to Mobil Oil Corporation. Split feed reforming and N-paraffin elimination from low boiling reformate. 3,770,614, Cl. 208-62.000.

Gravley, Wilton: *See*—
Sexton, James H.; Slover, Vasel R., Jr.; Patton, Bobbie J.; and Gravley, Wilton, 3,770,006.

Gray, James S., to Harris-Intertype Corporation, mesne. High-speed high-sensitivity threshold detector. 3,770,983, Cl. 307-235.00r.

Gray, John H.; Schneider, Alfred; Cormak, Anthony F.; and Ayers, Arnold L., to Allied Chemical Corporation. Apparatus for electrolytic oxidation or reduction, concentration, and separation of elements in solution. 3,770,612, Cl. 204-261.000.

Gray, Thomas H.; and Martin, Jack P., to Allegheny Ludlum Industries, Inc. Method of producing substantially non-oriented silicon steel strip by three-stage cold rolling. 3,770,517, Cl. 148-111.000.

Grayson, Richard D.; Dobson, John W.; and Unfried, Happy H., to International Telephone and Telegraph Corporation. Pilot light apparatus. 3,770,368, Cl. 431-354.000.

Greene, Charles W.; and Varner, George C., to Deering Milliken Research Corporation. Endless reinforcement and method for producing same. 3,770,042, Cl. 152-361.00r.

Greeninger, Marvin J., to Lectro Precision Tolls, Inc. Component lead cutting and bending apparatus. 3,769,823, Cl. 72-24.000.

Greenwood, Charles S.; and Chamberlin, Donald W., to FMC Corporation. Apparatus for sorting fruit according to color. 3,770,111, Cl. 209-73.000.

Greger, Karl, to Siemens Aktiengesellschaft. Contactless switching device. 3,771,092, Cl. 338-32.00r.

Greider, Charles Austin, to Townsend Engineering Company. Membrane skinning machine. 3,769,903, Cl. 99-589.000.

Greive, Aloys; and Tiemann, Theodor, to Hamel G.m.b.H. Zwirnmaschinen. Regulating belt tension in tangential-belt drive arrangement for the whorls of a yarn-twisting machine. 3,769,786, Cl. 57-105.000.

Greiwe, Daniel L.: *See*—
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Greve, Heinz, to Hauni-Werke Korber & Co., KG. Apparatus for regulating the operation of filter rod making machines. 3,769,883, Cl. 93-1.00c.

Grey, Jerry. Control system for a turbine engine. 3,769,792, Cl. 60-39.28t.

Grey, Jerry; and Zanft, Auram B., to Morse Boulger, Inc. Apparatus for removal of contaminants entrained in gas streams. 3,770,385, Cl. 23-260.000.

Griffin, Patrick Joseph, to RCA Corporation. Metal mask screen for screen-printing. 3,769,908, Cl. 101-127.000.

Griffin, William D. Swede for open-end wrenches. 3,769,863, Cl. 81-177.00a.

Griffis, William T. Revolver reloading device. 3,769,732, Cl. 42-89.000.

Griffith, William J.; and De Paepe, James Richard. Control circuit for a heating system. 3,770,196, Cl. 237-9.00r.

Grim, Robert E., to Autotronics, Incorporated. Wire print head. 3,770,092, Cl. 197-1.00r.

Gripe, William B.: *See*—
Holbrook, Edward L.; Gripe, William B.; and Norman, Melvin H., 3,769,996.

Gross, Hans-Werner: *See*—
Dorschner, Oskar; Gross, Hans-Werner; and Hartmann, Rainer, 3,770,714.

Grot, Walther Gustav, to Du Pont de Nemours, E. I., and Company. Laminates of support material and fluorinated polymer containing pendant side chains containing sulfonyl groups. 3,770,567, Cl. 161-189.000.

Grover, Richard T. Ring seal. 3,770,285, Cl. 277-165.000.

Growth International Industries Corporation: *See*—
Yates, George, Jr., 3,770,156.

Gruber, Hermann; and Degener, Eberhard, to Bayer Aktiengesellschaft. Heat hardenable mixtures of ε-caprolactam blocked polyisocyanates and cycloaliphatic polyamines. 3,770,703, Cl. 260-77.5tb.

Grubhofer, Nikolaus: *See*—
Grubhofer, Nikolaus; and Pogacar, Peter (said Pogacar assor. to said), 3,770,603.

Grubhofer, Nikolaus; and Pogacar, Peter, said Pogacar assor. to said Grubhofer, Nikolaus. Ampholytes for focusing electrophoresis. 3,770,603, Cl. 204-180.00r.

Gruppo Lepetit S.p.A.: *See*—
Cavalleri, Bruno; Bellasio, Elvio; Testa, Emilio; and Maffii, Giulio, 3,770,803.

Grussner, Andre: *See*—
Bretschneider, Hermann; Grassmayr, Klaus; Hohenlohe-Oehringen, Kraft; and Grussner, Andre, 3,770,761.

Gryctko, Carl E., to I-T-E Imperial Corporation. Circuit breaker contact structure. 3,770,922, Cl. 200-146.00r.

GTE Automatic Electric Laboratories Incorporated: *See*—
Caputo, James P.; Chybowski, Robert J.; and Harrington, Phil R., 3,770,948.
Stewart, James A., 3,771,039.
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GTE Laboratories Incorporated: *See*—
Cohen, Leonard D.; Shortt, Brian A.; and Urban, Michael J., 3,771,044.
Silver, H. Graham; Heller, Adam; Gardner, Phillip J.; and Argue, Gary R., 3,771,009.

GTE Sylvania Incorporated: *See*—
Audesse, Emery G.; and Hough, Harold L., 3,770,366.
Bonazoli, Robert P.; and Coggins, Donald I., 3,771,120.
Kerr, Jacob E.; and Reardon, Joseph D., 3,771,003.
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Guenther Systems, Inc.: *See*—
Kuehl, Guenther L.; and Depietro, Alfonso, 3,770,106.

Guerrini, Gian Paolo; and Falconieri, Remo, to Olivetti, Ing., C., & C., S.p.A. Printing mechanism having a single printing element. 3,770,095, Cl. 197-18.000.

Guichet, Niles F. Average articulator. 3,769,708, Cl. 32-32.000.

Guigan, Jean. Manifold liquid distributor. 3,770,027, Cl. 141-34.000.

Guillauma, Germain: *See*—
Villey-Desmeserets, F.; and Guillauma, Germain, 3,770,525.

Gulf Research & Development Company: *See*—
Gilbert, Ronald E., 3,770,493.

Gurev, Harold S.: *See*—
Crowe, William J.; Ritchie, Kim; and Gurev, Harold S., 3,770,499.

Guryanov, Viktor Artemievich: *See*—
Kassir, Gennady Andreevich; Temnikov, Evgeny Markovich; Umrilov, Nikolai Fedorovich; Kurenkov, Ivan Ivanovich; Lukyanchikov, Vyacheslav Grigorievich; Guryanov, Viktor Ar-

temievich; Ivashkin, Vasily Alexeevich; and Serov, German Vasilievich, 3,770,212.

Guthrie, Edward H., to Selectivend Inc. mesne. Sequential article vending mechanism for plural sources. 3,770,163, Cl. 221-114.000.

Gutschick, Lester C.; and Landow, Edwin S., to Zenith Radio Corporation. Hinged chassis arrangement for receiver apparatus and the like. 3,770,889, Cl. 178-7.900.

Gwinn, David A.: *See—*
Golahny, Yehuda; and Gwinn, David A., 3,771,050.

H & M Enterprises: *See—*
Marsh, Douglas D.; and Newlin, John C., 3,770,236.

Haack, Paul: *See—*
Maier, Eberhard; Endler, Walter; and Haack, Paul, 3,770,217.

Haag, Arthur P.; and Weiner, Meyer, to Dart Industries Inc. Process for producing titanium trichloride-aluminum trichloride in controlled proportions. 3,770,656, Cl. 252-442.000.

Haag, Arthur P., to Dart Industries Inc. Removal of titanium tetrachloride from titanium trichloride-aluminum trichloride. 3,770,657, Cl. 252-442.000.

Haas, Charles B.; Taylor, Richard E.; Crockett, David E.; Miller, James F.; Paul, Howard R.; and Reid, Charles J., to United States of America, Navy. Missile launching canister. 3,769,876, Cl. 89-1.800.

Habecker, John W., to Cherry Electrical Products Corporation. Alternate-action switch actuator with pawl stop plate also providing a guide for stroke-control means. 3,770,923, Cl. 200-153.00j.

Hableb, Karlem A.; and White, Jerry L., to Ford Motor Company. High temperature insulation. 3,770,557, Cl. 161-54.000.

Hach Chemical Company: *See—*
Stookey, Lawrence L., 3,770,735.

Hackenberg, Hubert; Spinnler, Rainer; and Karl, Horst, to Agfa-Gevaert Aktiengesellschaft. Photographic apparatus. 3,769,891, Cl. 95-31.0ac.

Haffner, Helmut Hubert; Kannheiser, Lothar Karl; and Schmied, Wilhelm, to Bunker Ramo Corporation. Presettable polarizing key for electrical connectors. 3,771,108, Cl. 339-113.00r.

HAG Aktiengesellschaft: *See—*
Roselius, Wilhelm; Vitzthum, Otto; and Hubert, Peter, 3,770,456.

Hagen, Earl W. Bicycle with infinitely variable ratio drive. 3,769,849, Cl. 74-217.00b.

Hagenbuch, Barry R.: *See—*
Brugger, Donald J.; and Hagenbuch, Barry R., 3,770,437.

Hager, Jerome E.; and Eisenhauer, John I., to National Distillers and Chemical Corporation. Polyolefin resin blends. 3,770,852, Cl. 260-897.00b.

Hagmeier, Dale L.: *See—*
Gavillet, Charles R.; Hagmeier, Dale L.; and Harris, Gregory K., 3,770,033.

Haigh, John M., to Parkwood Laminates, Inc. Method of making and installing a laminated product. 3,770,536, Cl. 156-71.000.

Hajek, Manfred: *See—*
Wagner, Kuno; and Hajek, Manfred, 3,770,799.

Halcon International, Inc.: *See—*
Kollar, John, 3,770,813.

Hale, Richard W.: *See—*
Ordway, Donald E.; and Hale, Richard W., 3,769,833.

Hall, Joseph J.; and Lamb, Leo M., to Johnson & Johnson. Adhesive tape and method. 3,770,542, Cl. 156-184.000.

Hall, Lewis W., Jr.: *See—*
Ware, Richard E.; and Hall, Lewis W., Jr., 3,770,620.

Hall, Robert P., Sr., to Arvin Industries, Inc. Magnetic disc recorder with transducer accessing mechanism utilizing a counterweighted arm. 3,770,907, Cl. 179-100.2ca.

Hall, Trenton O. Air scrubber apparatus with improved fire extinguishing means. 3,770,061, Cl. 169-2.00r.

Hallenbeck, Emerson J. Consumable weld insert. 3,770,302, Cl. 285-22.000.

Hallett, Tom E., to Flexible Metal Hose Manufacturing Company. Flexible joint for fluid conduit systems. 3,770,303, Cl. 285-45.000.

Hallewell, Raymond Thomas, to Toolmasters Limited. Method of making grinding members. 3,770,400, Cl. 51-295.000.

Halt, Ira E.: *See—*
Collins, Neil E.; and Halt, Ira E., 3,769,694.

Halter, Eugen: *See—*
Gloor, Karl; and Halter, Eugen, 3,770,959.

Hamada, Nagaharu: *See—*
Hayashi, Yukitaka; Yasuda, Isao; and Hamada, Nagaharu, 3,771,155.

Hamanaka, Ernest S.: *See—*
Brigth, Gene M.; and Hamanaka, Ernest S., 3,770,722.

Hamann, Karl; Dittmann, Walter; Sunder-Plassmann, Paul; and Gorke, Klaus, to Chemische Werke Huls Aktiengesellschaft. Coating compositions and process for the production thereof. 3,770,688, Cl. 260-32.80a.

Hamano, Hisashi, to International Knitlock Corporation. Apparatus for the manufacture of hook fabric material for fasteners. 3,770,359, Cl. 425-305.000.

Hamel G.m.b.H. Zwirnmaschinen: *See—*
Greive, Aloys; and Tiemann, Theodor, 3,769,786.

Hammer, Kenneth C., to General Motors Corporation. Passive belt arrangement. 3,770,294, Cl. 280-150.0sb.

Hammond, Donald L.: *See—*
Burgwald, Glenn M.; Kruger, William P.; and Hammond, Donald L., 3,771,066.

Hampartzoumain, Robert: *See—*
Jacquelin, Guy J.; Hampartzoumain, Robert; and Louvat, Jules, 3,770,126.

Hamsher, James F.; and Tate, Groton Bryce E., to Pfizer Inc. Chemically modified proteolytic enzymes. 3,770,587, Cl. 195-63.000.

Hamton Engineering Associates Inc.: *See—*
Swanson, Allen K., 3,770,979.

Handtmann, Albert, Metallgusswerk, Armaturen- und Fleischereimaschinenfabrik, Firma: *See—*
Muller, Johannes, 3,769,657.

Hanes, William C.: *See—*
Cotter, George H.; and Hanes, William C., 3,770,932.

Hanna, Arthur W.: *See—*
Romito, Vincent A.; and Hanna, Arthur W., 3,769,932.

Hanna, Robert W.; and Hession, John J., to International Business Machines Corporation. Field effect transistor detector amplifier cell and circuit providing a digital output and/or independent of background. 3,770,967, Cl. 250-214.00r.

Hannon, Donald F., to Laminex, Inc., mesne. Portable laminating press with vertical feed and a pair of laminating rolls. 3,770,553, Cl. 156-583.000.

Hannula, Raymond H.: *See—*
Nelson, Terrance D.; and Hannula, Raymond H., 3,770,925.

Hansen, John Edward: *See—*
Hartig, Martval John; and Hansen, John Edward, 3,770,711.

Hansen, Robert L.: *See—*
Atendido, Jorge B.; and Hansen, Robert L., 3,770,635.

Hansen, Siegfried, to Hughes Aircraft Company. Method and apparatus for gravity gradiometry. 3,769,840, Cl. 73-382.000.

Hanson, Henry Lloyd. Merchandise display with inventory control. 3,770,120, Cl. 206-79.000.

Hanzawa, Hirashi; and Yoneya, Juho, to Sony Corporation. Magnetic tape recording and/or reproducing apparatus with an automatic start device. 3,770,176, Cl. 226-176.000.

Hanzawa, Teruo: *See—*
Sato, Shui; Hanzawa, Teruo; Furuya, Masaaki; Endo, Takaya; and Inoue, Isaburo, 3,770,446.

Hara, Tadao: *See—*
Katsumi, Mamoru; Sato, Toshio; Yanagawa, Yasuo; and Hara, Tadao, 3,770,471.

Hardie, Waldo Richard; and Tankersley, Donald L., to Cutter Laboratories, Inc. 1-(1,3-Dioxolan-4-yl-alkyl)-piperazines and piperazine alkane diols. 3,770,743, Cl. 260-268.0ph.

Hardman Aerospace: *See—*
Smittle, Darrell G.; and Karlsen, Asbjorn, 3,770,315.

Hardman, Bruce B.: *See—*
Holub, Fred F.; Berger, Abe; and Hardman, Bruce B., 3,770,768.

Hardwick, David R.; and Stelzer, Raymond F., to Wagner Electric Corporation. Control valve. 3,769,997, Cl. 137-102.000.

Hardwicke-Etter Company: *See—*
Brooks, Eugene H., 3,769,658.

Harnden, John D., Jr.: *See—*
Kornrumpf, William P.; and Harnden, John D., Jr., 3,770,928.

Harnden, John D., Jr., to General Electric Company. Potted metal oxide varistor. 3,771,091, Cl. 338-20.000.

Harnex, Inc.: *See—*
Wais, Lowell; and Milbourne, Charles C., 3,769,939.

Harper, Marie R.; and Blea, Maxine R., to Harper-Blea, Incorporated. Automatically rocking baby cradle. 3,769,641, Cl. 5-109.000.

Harper-Blea, Incorporated: *See—*
Harper, Marie R.; and Blea, Maxine R., 3,769,641.

Harr, Jerome Danforth, to International Business Machines Corporation. Optical bar coding scanning apparatus. 3,770,940, Cl. 235-61.11e.

Harries, David Anthony, to Girling Limited. Master cylinder assemblies for hydraulic braking sytems. 3,769,801, Cl. 60-54.700.

Harrington, Phil R.: *See—*
Caputo, James P.; Chybowski, Robert J.; and Harrington, Phil R., 3,770,948.

Harris, Gregory K.: *See—*
Gavillet, Charles R.; Hagmeier, Dale L.; and Harris, Gregory K., 3,770,033.

Harris-Intertype Corporation: *See—*
Connor, Dale C.; and McDonough, Robert P., 3,770,984.
Price, Thomas C.; and Montgomery, Robert M., 3,769,695.

Harris-Intertype Corporation, mesne: *See—*
Gray, James S., 3,770,983.
Phelan, Harry R., 3,771,075.

Harsco Corporation: *See—*
Arndt, Charles J.; and Cross, Budd David, 3,770,253.

Hart, William: *See—*
Sloane, Thomas E., Jr.; Hart, William; and Pester, William B., 3,769,744.

Harter, Earl F., to Fidelity Electric Co., Inc. Generator with brushless exiter field. 3,771,046, Cl. 322-63.000.

Hartford Fibres Ltd.: *See—*
Rosenstein, Nathan; and Rosenstein, Abraham J., 3,769,787.

Hartford Spinning (Canada) Ltd.: *See—*
Rosenstein, Nathan; and Rosenstein, Abraham J., 3,769,787.

Hartig, Martval John; and Hansen, John Edward, to Du Pont de Nemours, E. I., and Company. Oriented structures of tetrafluoroethylene/perfluoro (alkyl vinyl ether) copolymer. 3,770,711, Cl. 260-87.50a.

Hartmann, Peter: *See—*
Knauf, Alfons; Hartmann, Peter; Schmidt, Adolf; and Wirsching, Franz, 3,770,468.

Hartmann, Rainer: *See—*
Dorschner, Oskar; Gross, Hans-Werner; and Hartmann, Rainer, 3,770,714.
Hartzler, Harold Eugene: *See—*
Buckler, Robert Thomas; and Hartzler, Harold Eugene, 3,770,821.
Harvey, Donald M., to Eastman Kodak Company. Self-processing film unit with a removable processing composition supplying means. 3,770,441, Cl. 96-76.00c.
Haselmo, Robert D. Stud removal and tapping kit. 3,769,648, Cl. 10-1.00r.
Hassler, Heinrich; and Schreiner, Horst, to Siemens Aktiengesellschaft. Method of producing a two layer contact piece. 3,770,497, Cl. 117-212.000.
Hastwell, Peter J., to Savin Business Machines Corporation. Corona charger configuration. 3,770,972, Cl. 250-324.000.
Hatcher, Burrell R., to Raytheon Company. Compact multifrequency band antenna structure. 3,771,158, Cl. 343-728.000.
Hauni-Werke Koerber & Co., KG: *See—*
Baier, Anton, 3,769,832.
Hauni-Werke Korber & Co., KG: *See—*
Greve, Heinz, 3,769,883.
Hauschopp, Alois, to Gewerkschaft Eisenhutte Westfalia. Longwall mining installation with guide cover plates. 3,770,321, Cl. 299-34.000.
Haussmann, Robert H.; and Epstein, Marvin A., to International Telephone and Telegraph Corporation. Frame synchronization system. 3,770,897, Cl. 179-15.0bs.
Haws, John F. Method for erecting poured concrete structure. 3,770,857, Cl. 264-33.000.
Hayasaka, Nobuo: *See—*
Kito, Ryoichiro; Maeda, Kazuo; Osawa, Misumi; Hayasaka, Nobuo; Watanabe, Hisatsugu; and Akaike, Takenori, 3,770,147.
Hayashi, Yasuo; Kodama, Kenji; Ohta, Minoru; and Saito, Shigeru, to Kureha Kagaku Kogyo Kabushiki Kaisha. Apparatus for purifying crystals comprising a stirrer with fins forming a discontinuous spiral. 3,770,386, Cl. 23-270.000.
Hayashi, Yoshihiro; and Iwatsuki, Masahiro, to Kabushiki-Kaisha Tokai Rika Denki Seisakusho. Automatic lock-up device for safety belt. 3,770,224, Cl. 242-107.400.
Hayashi, Yukitaka; Yasuda, Isao; and Hamada, Nagaharu, to Hitachi, Ltd. Color display system. 3,771,155, Cl. 340-324.0ad.
Haycock, John Norman; and Witten, Louis, to Martin Marietta Corporation. Nitranium perchlorate reaction rate alternation. 3,770,527, Cl. 149-74.000.
Haydon, Arthur W.; and Dean, John J., to Tri-Tech, Inc., mesne. Electric rotating machine. 3,770,998, Cl. 310-156.000.
Haye, Stanley V., Sr. Skirted tandem-wheel cover. 3,770,035, Cl. 150-54.00b.
Hayes, Thomas H., to VCA Corporation. Confining hand-held dispenser cap. 3,770,170, Cl. 222-402.011.
Heady, Robert E.; and Jacaway, William A., Jr., to CPC International Inc. Process for the production of glucose isomerase. 3,770,589, Cl. 195-66.00r.
Heath, Russel V., to General Motors Corporation. Method of dewaxing shell molds. 3,770,044, Cl. 164-35.000.
Heiba, El-Ahmadi I., to Mobil Oil Corporation. Liquid hydrocarbon fuels containing alkali metal salts of alkyl and diakyl-aminoalkyl phenols, as antiknock agents. 3,770,397, Cl. 44-75.000.
Heiba, El-Ahmadi Ibrahim, to Mobil Oil Corporation. Biodegradable hard water detergents. 3,770,643, Cl. 252-117.000.
Heightley, John Donnell: *See—*
Boll, Harry Joseph; Heightley, John Donnell; Koo, James Teh-Zen; Lynch, William Thomas; Nelson, James Thomas; Bard, Richard; Waaben, Sigurd Gunther; and Waggener, Herbert Atkin, 3,771,147.
Heimberger, Helmut, to Opti-Holding AG. Thermofixing apparatus for synthetic-resin slide-fastener. 3,770,361, Cl. 425-445.000.
Heimlicher, Paul; and Streit, Hans, to Maschinenfabrik Winkler, Fallert & Co., AG. Movably positionable cylinder arrangement for indirect printing presses. 3,769,910, Cl. 101-177.000.
Heiner, George. Educational device. 3,769,721, Cl. 35-9.00r.
Heldenbrand, Everett A., to Heldies Portable Pipe Service, Inc. Apparatus for straightening, untwisting and testing tubular elements. 3,769,836, Cl. 72-302.000.
Heldies Portable Pipe Service, Inc.: *See—*
Heldenbrand, Everett A., 3,769,836.
Helland, Howard M.: *See—*
Orbison, Frank H.; and Helland, Howard M., 3,770,581.
Hellbaum, Richard F.: *See—*
Garner, Howell D.; and Hellbaum, Richard F., 3,770,021.
Heller, Adam: *See—*
Silver, H. Graham; Heller, Adam; Gardner, Phillip J.; and Argue, Gary R., 3,771,009.
Helmuth, James G., to Chadwick-Helmuth Electronics, Inc. Fiber optics light source. 3,770,338, Cl. 350-96.00r.
Hembree, Ralo L., to FMC Corporation. Singulator for seed or the like. 3,770,164, Cl. 221-211.000.
Hender, Berkeley Stephens. Plural electric motor control systems. 3,771,032, Cl. 318-8.000.
Henderson, Roy Francis: *See—*
Celtruda, Joseph Drazio; Crosthwait, William Russell; Earle, John Goddell; Fennel, John Wenard, Jr.; and Henderson, Roy Francis, 3,771,138.
Hendren, Charles W., to McGraw-Edison Company. Screw conveyor system for durable press apparatus. 3,770,148, Cl. 214-17.00r.
Heneghan, Michael J.; and Hughes, Michael A., to International Business Machines Corporation. Control unit. 3,771,136, Cl. 340-172.500.
Henes, Steven W.: *See—*
Steman, Wolf; and Henes, Steven W., 3,770,165.
Hennessy, Leo B.; and Morris, John A., III, to Industrial Electronic Rubber Company. Foamed elastomeric product and method of making the same. 3,770,662, Cl. 260-2.550.
Hennig, Siegfried: *See—*
Ploch, Siegfried; Zeisberg, Peter; Gerischer, Heini; Hennig, Siegfried; Linack, Manfred; and Klinger, Kurt, 3,769,816.
Henrick, Clive A.; and Siddall, John B., to Zoecon Corporation. 3,4-Allenic aliphatic amides. 3,770,783, Cl. 260-404.000.
Henry, John: *See—*
Wheeler, Raymond Leslie; and Henry, John, 3,770,079.
Henry, Raymond M.; and Feldman, Charles F. Blends of a hydrolyzed ethylene/acrylate copolymer and an elastomeric polymer. 3,770,572, Cl. 161-217.000.
Herbert, Eugene J., Jr., to American Electronic Laboratories, Inc. Bidirectional signal processing means. 3,771,064, Cl. 333-1.000.
Herchenroeder, Robert Blanchard Herman, to Cabot Corporation, mesne. Lanthanum containing powders for making oxidation resistant metallics, method of making same, and metallic products. 3,770,391, Cl. 29-182.000.
Hercules Incorporated: *See—*
Bullock, Frederick C., 3,770,539.
Moore, Alvin G., 3,769,827.
Prosser, Thomas J., 3,770,834.
Vandenberg, Edwin J., 3,770,655.
Herfeld, Friedrich Walter. Apparatus for mixing plastics materials and the like during processing thereof. 3,770,251, Cl. 259-103.000.
Hermes, Julius, to Martin Processing Company, Incorporated. Method for the surface treatment of polymide materials. 3,770,528, Cl. 156-2.000.
Hernandez, Armando C.: *See—*
Blount, Lester L.; and Hernandez, Armando C., 3,769,968.
Herren, Cecil L.: *See—*
Palmer, Harold A.; and Herren, Cecil L., 3,770,057.
Herrmann, Cal C.: *See—*
Raddi, William J.; Kligerman, Jerome L.; and Herrmann, Cal C., 3,769,965.
Herrmann, Cal C., to ESB Incorporated. Body organ threshold analyzer. 3,769,986, Cl. 128-419.00p.
Herwig, Walter: *See—*
Reske, Eckart; Cherdron, Harald; Brinkmann, Ludwig; and Herwig, Walter, 3,770,669.
Herzing, Vernon J.: *See—*
Tolf, Ingvar L.; Herzing, Vernon J.; Miller, Everett L.; and Lightfoot, George L., 3,770,141.
Heseltine, Donald W.: *See—*
Jenkins, Philip W.; Heseltine, Donald W.; and Mee, John D., 3,770,451.
Hess, Howard V.; and Cole, Edward L., to Texaco, Inc. Coking of spent pulping liquors with subsequent SO_2 absorption. 3,770,574, Cl. 162-31.000.
Hession, John J.: *See—*
Hanna, Robert W.; and Hession, John J., 3,770,967.
Hession, John J.; and Klepp, Harry, to International Business Machines Corporation. Field effect transistor detector amplifier cell and circuit for low level light signals. 3,770,968, Cl. 250-214.00r.
Hessler, Albert; and Bucklin, Lyston E. Fishing equipment carrier. 3,769,741, Cl. 43-57.50r.
Heugebaert, Clement: *See—*
Poot, Albert Lucien; Heugebaert, Clement; Brinckman, Eric Maria; Von Konig, Anita; and Kampfer, Helmut, 3,770,448.
Hewko, Lubomyr O.: *See—*
Merrell, Richard L.; Hewko, Lubomyr O.; and Kepple, Richard K., 3,769,858.
Hewlett-Packard Company: *See—*
Burgwald, Glenn M.; Kruger, William P.; and Hammond, Donald L., 3,771,066.
Drehle, James R., 3,770,986.
Hickman, Malcolm Douglas, to Rocla Concrete Pipes Limited. Pipe winding machine. 3,770,219, Cl. 242-7.220.
Higdon, Philip E.: *See—*
Winterbottom, David A.; Wheadon, Ellis G.; and Higdon, Philip E., 3,770,511.
Higgins, Margaret D.: *See—*
DeNight, George G.; Farber, James F.; Glodek, John J.; and Higgins, Margaret D., 3,769,978.
Higgins, Robert B.: *See—*
McKibben, James W.; Goodman, Brian L.; and Higgins, Robert B., 3,770,624.
High Performance Products, Inc.: *See—*
Lettman, Klaus T., 3,769,645.
Hill, Albert Charles, to Girling Limited. Vehicle brake actuator and lock assembly. 3,770,084, Cl. 188-265.000.
Hinata, Masanao: *See—*
Sato, Akira; Shiba, Keisuke; and Hinata, Masanao, 3,770,440.
Hinsel, August; Stempel, Guenter; Horst, Gruene; and Weidinger, Kurt, to Varta Aktiengesellschaft. Duplex gas diffusion electrodes with gas diffusion means. 3,770,509, Cl. 136-120.00r.
Hintringer, Otmar: *See—*

Kohl, Arno; Schachinger, Martin; Kindl, Helmut; and Hintringer, Otmar, 3,771,067.
Hipple, George M.; and Rowley, Paul M., to Robertshaw Controls Company. Cam operated electrical switch with tangentially and radially threadable adjustable cam follower therefor. 3,770,924, Cl. 200-153.01b.
Hirano, Yutaka; Yamane, Tadayuki; and Matsumoto, Syozi, to Kuraray Co. Ltd. Super drawing polyester filaments after application of a di-ester of a polyalkylene glycol. 3,770,861, Cl. 264-130.000.
Hirao, Toshiro. Load insensitive time delay relay. 3,769,994, Cl. 137-84.000.
Hirase, Takahiro: *See*—
Kawaguchi, Suezi; Miura, Kozo; Esaki, Shigenobu; and Hirase, Takahiro, 3,771,159.
Hirsch, Allen F., to Ortho Pharmaceutical Corporation. O-(nitroaryl) oximes of 3-keto steroids. 3,770,780, Cl. 260-397.300.
Hirschfelder, Horst-Dieter; and Marzinkewitsch, Rene, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Wire-loop stacker. 3,770,025, Cl. 140-200.000.
Hirschler, Alfred E., to Sun Oil Company of Pennsylvania, mesne. Paraffin hydroisomerization with a combined catalyst of a hydrogenation component and a polyvalent metal cation exchanged zeolite. 3,770,845, Cl. 260-683.650.
Hirschmann, Ralph F.: *See*—
Milkowski, John D.; Veber, Daniel F.; and Hirschmann, Ralph F., 3,770,822.
Hitachi, Ltd.: *See*—
Asai, Shojiro; and Maruyama, Eiichi, 3,771,026.
Hayashi, Yukitaka; Yasuda, Isao; and Hamada, Nagaharu, 3,771,155.
Kurimoto, Kozo; Watanabe, Sosuke; and Uchida, Hiroyasu, 3,771,165.
Sagawa, Akio; and Kawakami, Hideaki, 3,770,966.
Yamazaki, Eiichi; and Kawamura, Takao, 3,771,105.
Hitachi Roentgen Company, Limited: *See*—
Tomita, Chuji; Miyazaki, Yuji; Kobayashi, Kazuo; and Okudaira, Mitsu, 3,770,955.
Hobi, Ernst. Holding and stretching device for trousers and skirts. 3,770,171, Cl. 223-95.000.
Hodogaya Chemical Co., Ltd.: *See*—
Ozutsumi, Minoru; Arakawa, Kyokuji; Yamamoto, Masao; and Narukawa, Osamu, 3,770,716.
Hoek, Serge; and Buhren, Wilhelm, to U.S. Philips Corporation. Device for the controlled emission of vapors. 3,770,199, Cl. 239-54.000.
Hoffman, Thomas E.: *See*—
United States of America, National Aeronautics and Space Administration, 3,771,074.
Hoffmann, Alfred: *See*—
Klein, Heinrich; Pieper, Rudolf; and Hoffmann, Alfred, 3,769,781.
Hoffmann-La Roche Inc.: *See*—
Bretschneider, Hermann; Grassmayr, Klaus; Hohenlohe-Oehringen, Kraft; and Grussner, Andre, 3,770,761.
Hofman, Lebert A.: *See*—
Dutkewych, Oleh B.; and Hofman, Lebert A., 3,770,464.
Hofmeister, Helmut; Laurent, Henry; Prezewowsky, Klaus; Wiechert, Rudolf; and Steinbeck, Hermann, to Schering Aktiengesellschaft. Pregnano(17,16 alpha-d)-1,3-oxathiolanes. 3,770,726, Cl. 260-239.55d.
Hogan, John R. Roofing shingle dolly. 3,769,916, Cl. 104-173.00r.
Hogg, Walter R., to Coulter Electronics, Inc. Scanner element for coulter particle apparatus. 3,771,058, Cl. 324-71.0cp.
Hohenlohe-Oehringen, Kraft: *See*—
Bretschneider, Hermann; Grassmayr, Klaus; Hohenlohe-Oehringen, Kraft; and Grussner, Andre, 3,770,761.
Hojo, Takeshi; and Kawada, Shin-Ichi, to Kabushiki Kaisha Tokyo Keiki (Tokyo Keiki Co., Ltd.). Deviation detecting apparatus. 3,771,085, Cl. 336-182.000.
Holbrook, Edward L.; Gripe, William B.; and Norman, Melvin H., to Amot Controls Corporation. Fluid timer and method. 3,769,996, Cl. 137-102.000.
Holcomb, Donald R.: *See*—
Forsyth, John P.; Forsyth, Robert W.; Holcomb, Donald R.; and Shiovitz, Nathan N., 3,770,060.
Hole, Kenneth Jmes: *See*—
Dodson, Stanley Charles; and Hole, Kenneth Jmes, 3,770,634.
Holko, Kenneth H.; and Moore, Thomas J., to United States of America, National Aeronautics and Space Administration. Apparatus for welding blades to rotors. 3,770,933, Cl. 219-107.000.
Holland, Dewey G.: *See*—
Uffner, Melville W.; and Holland, Dewey G., 3,770,685.
Holley, Danforth: *See*—
Holley, Danforth; and Nika, John W., 3,770,633.
Holley, Danforth; and Nika, John W., to Holley, Danforth. Anti-icing and lubricatig coating composition. 3,770,633, Cl. 252-28.000.
Hollingshead, Robert A.; and Pryor, Clyde Rober, to Hollingshead-Pryor Enterprises, Inc. Avionic tray and detachable metering plate for controlling air flow to an electronic instrument with cooling metering plate. 3,771,023, Cl. 317-100.000.
Hollingshead-Pryor Enterprises, Inc.: *See*—
Hollingshead, Robert A.; and Pryor, Clyde Rober, 3,771,023.
Holly, James A., to Hollymatic Corporation. Subdivided meat mixer and grinder. 3,770,216, Cl. 241-82.100.
Hollymatic Corporation: *See*—
Holly, James A., 3,770,216.
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Holub, Fred F.; and Evans, Milton L., to General Electric Company. Curable polycarbonate compositions. 3,770,697, Cl. 260-47.0xa.
Holub, Fred F.; Berger, Abe; and Hardman, Bruce B., to General Electric Company. Aliphatically unsaturated organopolysiloxanes. 3,770,768, Cl. 260-326.00e.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
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Horohashi, Toshiyuki: *See*—
Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Horohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isamu; Mori, Minno Kazuo; and Kobayashi, Tsoyoshi, 3,770,767.
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Hubbard, Addison W.; Powers, Kenneth W.; and O'Farrell, Charles P., to Esso Research and Engineering Company. Emulsification of sulfonated butyl rubber. 3,770,682, Cl. 260-29.70b.
Huber, Alvin J. Caroling bells. 3,769,870, Cl. 84-103.000.
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Hutton, Jonathan; and Stacey, Gilbert Joseph, to Imperial Chemical Industries Limited. 4-(4-Bromophenyl)-2-(2-hydroxyisopropyl)thiazole. 3,770,755, Cl. 260-302.00r.

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Ichikawa, Yasushi: *See—*
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Ide, Takashi. Device for an automobile for securing visibility in the rain. 3,769,898, Cl. 98-2.000.

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Itoh, Keiichi, to Olympus Optical Company. Telescopic lens system having small telephoto ratio. 3,770,341, Cl. 350-220.000.

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Kassir, Gennady Andreevich; Temnikov, Evgeny Markovich; Umrilov, Nikolai Fedorovich; Kurenkov, Ivan Ivanovich; Lukyanchikov, Vyacheslav Grigorievich; Guryanov, Viktor Artemievich; Ivashkin, Vasily Alexeevich; and Serov, German Vasilievich, 3,770,212.

Ivemy, Alan; Sherwen, Theo; and Pentelow, Tony, to Wright Rain Limited. Travelling irrigation machine. 3,770,202, Cl. 239-184.000.

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Iwata, Harry M.: *See—*
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Iwatsuki, Masahiro: *See—*
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Jacaway, William A., Jr.: *See—*
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Jackson, Barry Sidney, to Evode Limited. Pressure-sensitive adhesive laminate. 3,770,559, Cl. 161-89.000.

Jackson, Harry Y.; Walker, Charles G.; and Ramoska, John, to Eaton Corporation. Hoist having yielding means for load limiting. 3,770,086, Cl. 192-16.000.

Jackson, Norman Charles, to Standard Products Company, The. Exterior molding structure and method of manufacturing same. 3,770,545, Cl. 156-221.000.

Jackson, Vivian G. Convertible case. 3,770,114, Cl. 206-8.000.

Jacquelin, Guy J.; Hampartzoumain, Robert; and Louvat, Jules, to Societe Anonyme des Ateliers de Constructions. System for separating fibres from a fibrous suspension. 3,770,126, Cl. 210-81.000.

Jaeger, Horst, to Ciba-Geigy AG. N-s-triazine perfluoroalkylmonocarboxylic acid esters. 3,770,731, Cl. 260-248.0ns.

Jaeschke, Ralph L., to Eaton Corporation. Spline clearance reduction for couplings. 3,770,087, Cl. 192-18.00b.

Jaffe, Edward E., to Du Pont de Nemours, E. I., and Company. Production of chlorine-containing copper phthalocyanines. 3,770,765, Cl. 260-314.500.

Jager, Lothar, to U.S. Philips Corporation. Recording and/or play-back apparatus. 3,770,283, Cl. 274-4.00e.

Jahngen, Edwin G. Jr.: *See—*
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Jahnke, Donald E. Lung and kidney removal device. 3,769,656, Cl. 17-11.000.

Jamison, Will B., to Consolidation Coal Company. Fluid propelled mine haulage vehicle and method for underground haulage. 3,770,151, Cl. 214-152.000.

Janke, Bernhard: *See—*
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Janke, Donald E.; Marcade, Roque D.; and Karklys, Joseph, to Whirlpool Corporation. Variable timer runout control for dryer. 3,769,716, Cl. 34-33.000.

Jansen-Vanbeek, Guy; and Jansen-Vanbeek, John. Animal hobble. 3,769,940, Cl. 119-126.000.

Jansen-Vanbeek, John: *See—*
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Japan Gasoline Co., Ltd.: *See—*
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Japanese National Railways: *See—*
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Jenkins, Herbert R.; Iwata, Harry M.; and Jabbarpour, Asadollah A., to FMC Corporation. Process for purifying crude chloromethyl dihydrosafrole and piperonyl butoxide therefrom. 3,770,774, Cl. 260-340.500.

Jenkins, Philip W.; Heseltine, Donald W.; and Mee, John D., to Eastman Kodak Company. Silver halide emulsions sensitized with dyes containing heterocyclic nitrogen atoms substituted with an- OR group. 3,770,451, Cl. 96-135.000.

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Jespersen, Paul W., to Georgia-Pacific Corporation. Dispenser for rolls of flexible sheet material having means for holding a roll in a reserve position. 3,770,222, Cl. 242-55.300.

Jet-X Corporation: *See—*
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Jimenez, Narciso H. Automotive auxiliary windshield. 3,770,313, Cl. 296-95.00c.

Joesting, Frederick D., to Honeywell Inc. Diaphragm logic switching circuit. 3,769,995, Cl. 137-829.000.

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Johnson, Boyd R. Non-corrosive aquarium construction and method. 3,769,935, Cl. 119-5.000.

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Johnson, E. Curtis, to Buckbee-Mears Company. X-ray measuring grid. 3,770,956, Cl. 250-59.000.

Johnson, Elmer W. Nursing bottle. 3,770,154, Cl. 215-11.00b.

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Johnson, Peter D., to General Electric Company. High intensity lamp apparatus and method of operation thereof. 3,771,007, Cl. 313-183.000.

Johnson, Roger L.: *See—*
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Johnson, Tom W.; and Johnson, Joe L., to Sajar Plastics, Inc. Mixing valve assembly. 3,770,004, Cl. 137-315.000.

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Johnson, William S., to General Motors Corporation. Vehicle suspension system. 3,770,077, Cl. 180-71.000.

Johnston, Orin B. Remote control system for kites and the like. 3,770,230, Cl. 244-155.00a.

Johnston, Samuel, to Bunker Ramo Corporation. Adjustable electrical resistor having a helical coil of resistance material in threaded, biased engaged with a rotatable internal contact member. 3,771,094, Cl. 338-143.000.

Johnstone, Robert F.; and Balasubramanian, Kodandraman, to Crane Canada Limited. Valve assembly with automatic draining feature. 3,770,016, Cl. 137-625.220.

Jones, Bruce A.: *See—*
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Jones, Drexel D., to Scott Paper Company. Packaging system. 3,770,118, Cl. 206-47.00r.

Jones, George R.; Dunn, James F.; and Purdum, Glenn R., Jr. Pulmonary inhalation device. 3,769,967, Cl. 128-2.080.

Jones, Loyd W., to Amoco Production Company. Oil-soluble phosphonic acid composition. 3,770,815, Cl. 260-501.120.

Jones, Nelson A.: *See—*
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Jones, Stanely Adair. Rotary mower blades. 3,769,784, Cl. 56-295.000.

Jordan, William E., to Xerox Corporation. Method and apparatus for fuser assembly cooling in an electrostatographic machine. 3,770,346, Cl. 355-3.000.

Josephian, William. Bias-groove piston and ring therefor. 3,769,882, Cl. 92-172.000.

Joyce, Asa W.; and Leavitt, Julian J., to American Cyanamid Company. Azo dyes from chlorocarbonyl aryl dichlorotriazines. 3,770,717, Cl. 260-153.000.

Juliano, Richard F., to Reliable Automatic Sprinkler Company Inc., The. Center strut fire protection sprinkler head. 3,770,063, Cl. 169-39.000.

Jungerman, Eric; and Casely, Robert E., to Armour-Dial, Inc. Synergistic antiseptic compositions containing certain hydroxycarbanilides. 3,770,642, Cl. 252-107.000.

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Jurek, Dennis J.: *See—*
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Jurgeleit, Wolfgang; and Winter, Hermann, to Chemische Werke Huls Aktiengesellschaft. Process of making an open-celled vinyl chloride polymer plastisol. 3,770,665, Cl. 260-2.50p.

Juston, Claude: *See—*
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Justrite Manufacturing Company, The: *See—*
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Jvirblis, Gail D.: *See—*
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Kabushiki Kaisha Daini Seikosha: *See—*
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Kabushiki Kaisha Hattori Tokeiten: *See*—
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Kabushiki Kaisha Kito: *See*—
Kito, Ryoichiro; Maeda, Kazuo; Osawa, Misumi; Hayasaka, Nobuo; Watanabe, Hisatsugu; and Akaike, Takenori, 3,770,147.

Kabushiki Kaisha Komine Auto Center: *See*—
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Kabushiki Kaisha Kyodo Denshi Gijutsu Kenkyusho: *See*—
Kabaya, Yoshihiko; and Ikeda, Heishichi, 3,770,520.

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Ueki, Shiro; Fukada, Tadayuki; and Miyata, Yoshimitsu, 3,770,663.
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Kabushiki Kaisha Ricoh: *See*—
Kasuya, Kazuhiko; Ohta, Wasaburo; and Okuno, Zenjiro, 3,770,485.
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Kabushiki Kaisha Sankosha: *See*—
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Kabushiki Kaisha Tokyo Keiki (Tokyo Keiki Co., Ltd.): *See*—
Hojo, Takeshi; and Kawada, Shin-Ichi, 3,771,085.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Awano, Taikichi; and Oishi, Yoshihiro, 3,769,696.

Kabushiki-Kaisha Tokai Rika Denki Seisakusho: *See*—
Hayashi, Yoshihiro; and Iwatsuki, Masahiro, 3,770,224.

Kabushikikaisha Tokyo Keiki: *See*—
Mito, Akio; Desaki, Masayasu; Koike, Kunio; and Kikui, Shunji, 3,770,240.

Kabushikikaisha Tokyo Keiki (Tokyo Keiki Co. Ltd.): *See*—
Tamura, Kohzoh; and Matsuno, Shigetoshi, 3,770,020.

Kadokura, Hidekimi: *See*—
Ichiki, Eiichi; Iida, Kazuo; Matsui, Atsuro; and Kadokura, Hidekimi, 3,770,789.

Kagakii, Akio: *See*—
Kobayashi, Humio; Sakata, Hiroshi; Mizoguti, Takesi; Kagakii, Akio; and Naramura, Isuyoshi, 3,770,736.

Kahl, Joseph. Submersible sampler. 3,769,842, Cl. 73-425.600.

Kahl, Joseph. Hinged impact messenger for marine equipment. 3,769,928, Cl. 114-221.00r.

Kahre, George H. Rotary internal combustion engine. 3,769,945, Cl. 123-8.230.

Kaiser Aluminum & Chemical Corporation: *See*—
Floyd, Paul H.; and Binczewski, George J., 3,770,424.
McDole, Ewell E.; and Howard, Frank L., 3,770,636.

Kaizawa, Yoshihiro; and Watanabe, Sakuji, to Nippon Kogaku K.K. Potentiometer using a voltage follower circuit. 3,771,053, Cl. 324-140.00r.

Kalawaites, Frank, to Johnson & Johnson. Method and apparatus (continuous imperforate portions on backing means of open sandwich). 3,769,659, Cl. 19-161.00p.

Kalfaian, Meguer V. Voice identification system with normalization for both the stored and the input voice signals. 3,770,891, Cl. 179-1.0sb.

Kallmes, Otto J.; and Saddler, Richard L., to Nicolet Paper Company. Diffuser for paper machine headbox. 3,770,580, Cl. 162-341.000.

Kamperman, David R., to Dart Industries Inc. Treatment of electroless process and stripping solutions. 3,770,630, Cl. 210-50.000.

Kampfer, Helmut: *See*—
Poot, Albert Lucien; Heugebaert, Clement; Brinckman, Eric Maria; Von Konig, Anita; and Kampfer, Helmut, 3,770,448.

Kanda, Kaoru: *See*—
Nagahori, Tetuo; and Kanda, Kaoru, 3,771,125.

Kandi, John Richard: *See*—
McSweeney, Daniel Robert; and Kandi, John Richard, 3,770,463.

Kania, Albert T.; and Jerominek, Joseph, to Gentex Corporation. Lens cutting and bevel edging machine. 3,769,755, Cl. 51-101.01g.

Kannheiser, Lothar Karl: *See*—
Haffner, Helmut Hubert; Kannheiser, Lothar Karl; and Schmied, Wilhelm, 3,771,108.

Kao Soap Co., Ltd.: *See*—
Katsumi, Mamoru; Sato, Toshio; Yanagawa, Yasuo; and Hara, Tadao, 3,770,471.

Kapolyi, Laszlo; Lazar, Ferenc; Vamos, Gyorgy; and Galauner, Bela, to Tatabanyai Szenbanyak. Process for preparing self-disintegrating products containing dicalcium silicate. 3,770,469, Cl. 106-120.000.

Kapperman, Dorothy M., administratrix: *See*—
Kipple, Harry P.; Kapperman, Francis C., deceased; and Cozzarin, Virgil J., 3,769,756.

Kapperman, Francis C., deceased: *See*—
Kipple, Harry P.; Kapperman, Francis C., deceased; and Cozzarin, Virgil J., 3,769,756.

Karklys, Joseph: *See*—
Janke, Donald E.; Marcade, Roque D.; and Karklys, Joseph, 3,769,716.

Karl, Horst: *See*—
Hackenberg, Hubert; Spinnler, Rainer; and Karl, Horst, 3,769,891.

Karlsen, Asbjorn: *See*—
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Karman, Harvey, to Medical Concepts, Inc. Medical instruments. 3,769,980, Cl. 128-304.000.

Karper, Paul W.: *See*—
Porter, John P.; and Karper, Paul W., 3,769,830.

Kashio, Toshio, to Casio Computer Co., Ltd. Memory device having main shift register and supplementary shift register. 3,771,133, Cl. 340-172.500.

Kassir, Gennady Andreevich; Temnikov, Evgeny Markovich; Umrilov, Nikolai Fedorovich; Kurenkov, Ivan Ivanovich; Lukyanchikov, Vyacheslav Grigorievich; Guryanov, Viktor Artemievich; Ivashkin, Vasily Alexeevich; and Serov, German Vasilievich. Method of comminting materials preferably conducting materials, and an apparatus for accomplishing the same. 3,770,212, Cl. 241-1.000.

Kast, Mark D. Device for treating aquarium water. 3,770,128, Cl. 210-169.000.

Kasten, Walter, to Bendix Corporation, The. Particle filter-sound muffler. 3,769,780, Cl. 55-276.000.

Kasuya, Kazuhiko; Ohta, Wasaburo; and Okuno, Zenjiro, to Kabushiki Kaisha Ricoh. Method for liquid-developing an electrostatic image. 3,770,485, Cl. 117-37.01e.

Katagiri, Yoshio; and Miyata, Yoshio, to Kabushiki Kaisha Daini Seikosha and Kabushiki Kaisha Hattori Tokeiten. Nematic liquid crystal compositions. 3,770,653, Cl. 252-408.000.

Katagiri, Yoshio; Miyata, Yoshio; and Nagasaki, Osamu, to Kabushiki Kaisha Daini Seikosha and Kabushiki Kaisha Hattori Tokeiten. Nematic liquid crystal. 3,770,654, Cl. 252-408.000.

Kato, Hirotetu: *See*—
Kawano, Hideo; Kato, Hirotetu; and Tsuji, Nobuo, 3,770,450.

Katsumi, Mamoru; Sato, Toshio; Yanagawa, Yasuo; and Hara, Tadao, to Kao Soap Co., Ltd. Starching composition. 3,770,471, Cl. 106-197.00c.

Katsura, Toyozo: *See*—
Akiyama, Hisao; Komatsu, Toshiaki; and Katsura, Toyozo, 3,770,809.

Katsuragawa Denki Kabushiki Kaisha: *See*—
Kinoshita, Koichi; Uehara, Shiro; Nagame, Hiroshi; and Yamada, Kazukiyo, 3,770,429.

Kaufman, Aaron M., to Reliable Machine Works, Inc. Shearing apparatus with means to detect clearance between cutting blades. 3,769,666, Cl. 26-15.00r.

Kaufman, Carl L.: *See*—
Calhoun, Harry C.; and Kaufman, Carl L., 3,771,095.

Kawada, Shin-Ichi: *See*—
Hojo, Takeshi; and Kawada, Shin-Ichi, 3,771,085.

Kawaguchi, Suezi; Miura, Kozo; Esaki, Shigenobu; and Hirase, Takahiro, to Clarion Co., Ltd. and Asahi Glass Co., Ltd. Windshield antenna for automobile. 3,771,159, Cl. 343-729.000.

Kawakami, Hideaki: *See*—
Sagawa, Akio; and Kawakami, Hideaki, 3,770,966.

Kawakubo, Kazuo; Fujii, Motoharu; and Ariga, Masao, to Canon Kabushiki Kaisha. Electrophotographic copying apparatus. 3,770,345, Cl. 355-3.000.

Kawamura, Mitsuaki: *See*—
Mikami, Bunji; and Kawamura, Mitsuaki, 3,770,369.

Kawamura, Takao: *See*—
Yamazaki, Eiichi; and Kawamura, Takao, 3,771,105.

Kawano, Hideo; Kato, Hirotetu; and Tsuji, Nobuo, to Fuji Photo Film Co., Ltd. Direct positive silver halide photographic photosensitive material. 3,770,450, Cl. 96-126.000.

Kawasaki, Kazuo; and Arai, Kazuo, to Nissan Denshi Kabushiki Kaisha. Tuning device effecting simultaneous variation of inductance and capacitance. 3,771,079, Cl. 334-70.000.

Kay, David B., to Texas Instruments, Incorporated. Header assembly for lasers. 3,771,031, Cl. 317-235.00r.

Kedrinsky, Vasily Nikolaevich; and Zudov, Boris Grigorievich. Cradle of a gear-cutting machine. 3,769,877, Cl. 90-6.000.

Kel-Lite Industries, Inc.: *See*—
Nelson, Norman C., 3,769,733.

Kelch, David J.; Kraus, Walter R.; and Clark, Jack D., to Mead Corporation, The. Process controller. 3,770,608, Cl. 204-195.00m.

Kelco Company: *See*—
Schuppner, Harry R., Jr., 3,770,462.

Keller, Robert Franklin: *See*—
Kessler, Sebastian William, Jr.; and Keller, Robert Franklin, 3,769,688.

Kelley, James K.: *See*—
Mashikian, Matthew S.; Kelley, James K.; and McMurray, William C., 3,770,877.

Kelly, Robert C., to Upjohn Company, The. 2-Hydroxy-3-(1-hydroxyethyl)-5-carboxy-3,4-dihydro-2H-pyran-4-acetic acid 4,5-dimethyl ester, 3-methanesulfonate. 3,770,777, Cl. 260-345.800.

Kelsey, David H., to Sloane, R & G, Manufacturing Company, Inc. Color bond surveillance system. 3,770,547, Cl. 156-314.000.

Kemlite Corporation: *See*—
Morse, Donald B.; and Pribish, Bernard A., 3,769,864.

Kemper, Eugene L., to Upton Industries, Inc. Method and apparatus for removing coatings from metals. 3,770,501, Cl. 134-19.000.

Kemper, John A., Jr.: *See*—
Childress, Richard; and Kemper, John A., Jr., 3,770,546.

Kendale Industries, Inc.: *See*—
Setele, William O., 3,770,157.

Kendall Company, The, mesne: *See*—
Collins, Robert F., 3,769,971.
McWhorter, Daniel M., 3,769,981.
Newman, Nicholas S., 3,770,562.

Kendall, Ernest G.: *See*—
Pepper, Roger T.; and Kendall, Ernest G., 3,770,488.

Kendall, Jerry A., to Elab Corporation. Apparatus for manufacturing connector terminals. 3,769,679, Cl. 29-203.00b.

Kenning, Joseph N., 1/2 interest to Voigt, Donald B. Bunk feeder. 3,769,937, Cl. 119-52.00b.

Kent, Marc T., Jr. Information display system. 3,769,727, Cl. 40-62.000.

Kenyon, Kenneth H.: *See*—
Bergum, Bernard C.; Bilhorn, John M.; Kenyon, Kenneth H.; Macaulay, William R.; and Youngquist, John A., 3,770,505.

Kepner, Carl L.: *See*—
Cobb, Delwin E.; Kepner, Carl L.; Roberts, Wayne E.; and Woody, Albert L., 3,770,322.

Keppel, Charles M.; and Weiss, Irwin K., to General Motors Corporation. Door lock assembly and door retractor interlock. 3,770,078, Cl. 180-111.000.

Kepple, Richard K.: *See*—
Merrell, Richard L.; Hewko, Lubomyr O.; and Kepple, Richard K., 3,769,858.

Kerr, Jacob E.; and Reardon, Joseph D., to GTE Sylvania Incorporated. Shielded cathode ray tube electron gun. 3,771,003, Cl. 313-70.00c.

Kersey, John P.: *See*—
Flournoy, Norman E.; and Kersey, John P., 3,769,711.

Kervizic, Jacques; Masic, Rene; and Warnecke, Robert Jean, to Thomson-CSF. Turret device for positioning crucibles in ion sources. 3,770,870, Cl. 13-31.000.

Kerwood, Joseph Edward, to Monsanto Company. N-azolylsulfenamides. 3,770,758, Cl. 260-305.000.

Kessler, Sebastian William, Jr.; and Keller, Robert Franklin, to RCA Corporation. Method of making an electrically-insulating seal between a metal body and a semiconductor device. 3,769,688, Cl. 29-473.100.

Key, Lawrence M. Modular, unitary sectional, portable fence. 3,770,246, Cl. 256-25.000.

Keymatch Computer Corporation: *See*—
Boardman, John D., 3,771,128.

Keyser, Lewis R., to Price Brothers Company. Subaqueous pipe connector. 3,770,304, Cl. 285-45.000.

Kidde, Walter, & Company, Inc.: *See*—
Walbridge, Lyman H., 3,770,364.

Kidner, Henry Gerald; and Taylor, David Alexander, to British Insulated Callender's Cable Limited. Combined electromagnetic waveguide. 3,771,076, Cl. 333-95.00r.

Kidner, Henry Gerald; and Taylor, David Alexander, to British Induslated Callender's Cable Limited. Mode filter for an electromagnetic waveguide. 3,771,078, Cl. 333-95.00r.

Kiehs, Karl; Koenig, Karl-Heinz; and Fischer, Adolf, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Substituted D nitroanilines. 3,770,779, Cl. 260-349.000.

Kiemle, Horst, to Siemens Aktiengesellschaft. One dimensional holographic recording of electrical signals. 3,770,886, Cl. 178-6.70r.

Kihara, Nobutoshi. Mechanism for engaging a magnetic recording tape in a cassette and for withdrawing the tape from the cassette and placing the tape in engagement with the guide drum of a magnetic recording and/or reproducing apparatus. 3,770,904, Cl. 179100.2za.

Kikui, Shunji: *See*—
Mito, Akio; Desaki, Masayasu; Koike, Kunio; and Kikui, Shunji, 3,770,240.

Killingbeck, Graydon Wayne: *See*—
Corbett, John M.; Bussey, Marlin G.; and Killingbeck, Graydon Wayne, 3,770,668.

Kim, Byoung Woon, to Electronic Sensing Products, Inc. Animated display amusement device. 3,770,271, Cl. 273-86.00r.

Kim, Tai K.; Paganozzi, L. Rita; MacInnis, Martin B.; and Laferty, John M., to GTE Sylvania, Incorporated. Recovery of molybdenum. 3,770,869, Cl. 423-54.000.

Kimbro, William S.: *See*—
Chambers, James C.; and Kimbro, William S., 3,770,411.

Kimura, Kikuzi, to Shibata Kagaku Kikai Kogyo Kabushiki Kaisha. Method of spectra analytical filter paper dust sampling. 3,770,356, Cl. 356-207.000.

Kindl, Helmut: *See*—
Kohl, Arno; Schachinger, Martin; Kindl, Helmut; and Hintringer, Otmar, 3,771,067.

King, Lowell A.: *See*—
Brabson, George Dana, Jr.; King, Lowell A.; Seegmiller, David W.; and Fannin, Armand A., Jr., 3,770,503.

Kingsley Dryer Corporation: *See*—
Roach, William F., 3,769,817.

Kinner, James L.: *See*—
Houghton, Frank A.; Wasielewski, Leonard; and Kinner, James L., 3,770,162.

Kinoshita, Joshyo: *See*—
Roztoczy, Ferenc E.; Casau, Celestin J.; and Kinoshita, Joshyo, 3,770,518.

Kinoshita, Koichi; Uehara, Shiro; Nagame, Hiroshi; and Yamada, Kazukiyo, to Katsuragawa Denki Kabushiki Kaisha. Method for removing corona discharge contaminants in electrophotography. 3,770,429, Cl. 96-1.00r.

Kipp, Kevin K.: *See*—
Oswitch, Stanley; and Kipp, Kevin K., 3,770,690.

Kipple, Harry P.; Kapperman, Francis C., deceased; (by Kapperman, Dorothy M., administratrix;); and Cozzarin, Virgil J., to Westinghouse Electric Corporation. Automatic grinding and machining apparatus. 3,769,756, Cl. 51-43.000.

Kirch, Hans-Joachim: *See*—
Levacher, Friedrich; Dornseifer, Karl; Nolting, Karl-Heinz; Frielingsdorf, Helmut; and Kirch, Hans-Joachim, 3,771,069.

Kirchgessner, Edwin M.; and Jones, Nelson A., to Caterpillar Tractor Company. Engine mount with thrust limiting and damping means. 3,770,231, Cl. 248-9.000.

Kirk, James A.: *See*—
Linhardt Hans D.; Kirk, James A.; and Lancaster, Raymond E., 3,770,048.

Kirkpatrick, Milton E; Piwonka, Thomas S.; and Marcus, Bruce D., to TRW Inc. Apparatus for unidirectionally solidifying metals. 3,770,047, Cl. 164-338.000.

Kisle, Adolph J.; and Brase, George. Stud wrench. 3,769,861, Cl. 81-53.200.

Kitazawa, Takaji: *See*—
Yoshizawa, Atsushi; and Kitazawa, Takaji, 3,770,672.

Kito, Ryoichiro; Maeda, Kazuo; Osawa, Misumi; Hayasaka, Nobuo; Watanabe, Hisatsugu; and Akaike, Takenori, to Kabushiki Kaisha Kito. Multi-rack stacker system. 3,770,147, Cl. 214-16.40a.

Kitrilakis, Sotiris: *See*—
Fatt, Irving; and Kitrilakis, Sotiris, 3,769,961.

Kitzner, Ernest W.; Rhodes, Alex; and Shachter, Moses, to Ford Motor Company. Catalytic converter with electrically resistive catalyst support. 3,770,389, Cl. 23-288.00f.

Kiyose, Norihiko: *See*—
Tsuruta, Hisao; and Kiyose, Norihiko, 3,770,354.

Klapproth, Edward H.; and Sparr, Donald J., to Flxible Co., The. Resiliently supported seat. 3,770,235, Cl. 248-399.000.

Klein, Alfons: *See*—
Pelz, Willibald; Credner, Hans-Heinrich; Schulte, Walter; Klein, Alfons; Wedemeyer, Karlfried; and Nittel, Fritz, 3,770,445.

Klein, Heinrich; Pieper, Rudolf; and Hoffmann, Alfred, to Siemens Aktiengesellschaft. Apparatus for drying steam in nuclear power steam generators. 3,769,781, Cl. 55-261.000.

Kleist, Herbert H., to Junkunc Bros. American Lock Company. Key code cutting machine. 3,769,865, Cl. 83-278.000.

Klepp, Harry: *See*—
Hession, John J.; and Klepp, Harry, 3,770,968.

Kligerman, Jerome L.: *See*—
Raddi, William J.; Kligerman, Jerome L.; and Herrmann, Cal C., 3,769,965.

Klinger, Kurt: *See*—
Ploch, Siegfried; Zeisberg, Peter; Gerischer, Heini; Hennig, Siegfried; Linack, Manfred; and Klinger, Kurt, 3,769,816.

Klooster, Henry J.: *See*—
Freireich, Ernest; and Klooster, Henry J., 3,770,622.

Kloske, Richard A.; and Barclay, William F., to Republic Steel Corporation. Cold formable valve steel. 3,770,426, Cl. 75-128.00a.

Kloth, James Albert, to AMP Incorporated. Manufacturing electrical harnesses. 3,769,701, Cl. 29-624.000.

Kluge, Werner Erich, to Bell Canada-Northern Electric Research Limited. Magnetic bubble domain switching device. 3,770,978, Cl. 307-88.01c.

Klumb, Ralph H.; and Hutchinson, John J., to Combustion Engineering, Inc. Fuel assembly hold-down device. 3,770,583, Cl. 176-76.000.

Knapp, Edward Ronald, to Timken Company, The. Manufacture of rings for rolling bearings. 3,769,671, Cl. 29-148.40r.

Knapp, Richard V.: *See*—
Stobbe, Richard P.; and Knapp, Richard V., 3,770,239.

Knapsack Aktiengesellschaft: *See*—
Muller, Fritz; Queck, Robert; Koch, Josef; Kowalski, Werner; Nolden, Werner; Selbsi, Gunter; and During, Helmut, 3,770,207.

Knauf, Alfons; Hartmann, Peter; Schmidt, Adolf; and Wirsching, Franz, to Gebr. Knauf Westdeutsche Gipswerke. Process for treating plaster of paris. 3,770,468, Cl. 106-110.000.

Knize, Elmer J., to Lippy Can Co., Ltd. Can or container and the lid therefor. 3,770,161, Cl. 220-42.00c.

Knoepfel, Hanspeter; and Silver, Spencer F., to Minnesota Mining and Manufacturing Company. Pressure sensitive adhesive copolymer formed from vinyl monomer and zwitterion monomer and tapes made therewith. 3,770,708, Cl. 260-80.730.

Knowles, Hugh Shaler; and Carlson, Elmer Victor, to Industrial Research Products, Inc. Hearing aid system. 3,770,911, Cl. 179-107.00s.

Kobayashi, Humio; Sakata, Hiroshi; Mizoguti, Takesi; Kagakii, Akio; and Naramura, Isuyoshi, to Unitika Kabushiki Kaisha. Substituted-s-triazines. 3,770,736, Cl. 260-249.800.

Kobayashi, Kazuo: *See*—
Tomita, Chuji; Miyazaki, Yuji; Kobayashi, Kazuo; and Okudaira, Mitsu, 3,770,955.

Kobayashi, Kyozo, to Mitsubishi Denki Kabushiki Kaisha. Actuator for operating an alarm device to inform the completion of cooking in a microwave oven. 3,770,929, Cl. 219-10.550.

Kobayashi, Tsoyoshi: *See*—
Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Horohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isamu; Mori, Minno Kazuo; and Kobayashi, Tsoyoshi, 3,770,767.

Kobe Steel, Ltd.: *See*—
Nakanishi, Sadayuki, 3,770,050.

Kobus, Stanislas; Kruithof, Albert; and Viellevoyl, Lucien Nicolas Leon, to International Standard Electric Corporation. Scanner for a centrally controlled telephone switching system. 3,770,899, Cl. 179-18.0fg.

Koch, Josef: *See—*
Muller, Fritz; Queck, Robert; Koch, Josef; Kowalski, Werner; Nolden, Werner; Selbsi, Gunter; and During, Helmut, 3,770,207.
Koch, Wolfgang: *See—*
Gams, Erwin; Namenyi, Istvan; Wahlig, Helmut; Erdmann, Dietrich; and Koch, Wolfgang, 3,770,817.
Kodaira, Nobuhisa. Apparatus for heat treatment of synthetic fibre yarn. 3,770,051, Cl. 165-105.000.
Kodama, Kenji: *See—*
Hayashi, Yasuo; Kodama, Kenji; Ohta, Minoru; and Saito, Shigeru, 3,770,386.
Koenig, Karl-Heinz: *See—*
Kiehs, Karl; Koenig, Karl-Heinz; and Fischer, Adolf, 3,770,779.
Koga, Tadaaki: *See—*
Fujiwhara, Mitsuto; Sato, Ryosuke; Koga, Tadaaki; and Matsuo, Shunji, 3,770,436.
Kogert, Herbert. Cut rubberised stranded wire. 3,770,561, Cl. 161-144.000.
Koguro, Masao: *See—*
Enomoto, Satoru; Wada, Hisayuki; Fujioka, Mikio; and Koguro, Masao, 3,770,645.
Kohl, Arno; Schachinger, Martin; Kindl, Helmut; and Hintringer, Otmar, to Siemens Aktiengesellschaft. Laser apparatus for use in operations with explosion hazard. 3,771,067, Cl. 331-94.50d.
Kohl, William J. Permanent basement window frame and pouring buck. 3,769,769, Cl. 52-212.000.
Kohler, Alfred: *See—*
Edele, Reinhard; and Kohler, Alfred, 3,769,654.
Kohut, Jaroslaw: *See—*
Graff, William A.; and Kohut, Jaroslaw, 3,770,568.
Koike, Kunio: *See—*
Mito, Akio; Desaki, Masayasu; Koike, Kunio; and Kikui, Shunji, 3,770,240.
Kokjohn, Leonard Dennis, to Emerson Electric Co. Electric heating assemblies. 3,770,939, Cl. 219-532.000.
Kolbe, Joachim: *See—*
Lenz, Hans; Kolbe, Joachim; Marzolph, Herbert; and Bernklau, Kurt, 3,770,495.
Koleske, Joseph Victor; Lundberg, Robert Dean; Pollart, Dale Flavian; and Smarook, Walter Henry, to Union Carbide Corporation. Composite article having a heat-activatable body. 3,770,564, Cl. 161-183.000.
Kolker, William A., 49% interest to Miller, Edward P. Bicycle storage device. 3,770,133, Cl. 211-19.000.
Kollar, John, to Halcon International, Inc. Process for producing glycol esters. 3,770,813, Cl. 260-497.00r.
Komatsu, Hiroaki: *See—*
Ishikawa, Sachio; Komatsu, Hiroaki; Imura, Junichi; and Takemi, Hiroshi, 3,771,093.
Komatsu, Toshiaki: *See—*
Akiyama, Hisao; Komatsu, Toshiaki; and Katsura, Toyozo, 3,770,809.
Kominami, Naoya; Iwaisako, Toshiyuki; and Ohki, Kusuo, to Asahi Kasei Kogyo Kabushiki Kaisha. Method of reforming hydrocarbons. 3,770,616, Cl. 208-138.000.
Komine, Shinsuke, to Kabushiki Kaisha Komine Auto Center. Noctilucent reflective helmet. 3,770,483, Cl. 117-33.000.
Kominek, Leo A., to Upjohn Company, The. Process for the microbiological 1-dehydrogenation of certain 4,9-(11) pregnadienes. 3,770,586, Cl. 195-51.00e.
Kondoh, Ikuyo: *See—*
Okuno, Zenjiro; Mizuno, Akinori; and Kondoh, Ikuyo, 3,770,637.
Konings, P., Machinefabriek, Ijzer-en Metaal Gieterij N.V.: *See—*
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Konishiroku Photo Industry Co., Ltd.: *See—*
Fujiwhara, Mitsuto; Sato, Ryosuke; Koga, Tadaaki; and Matsuo, Shunji, 3,770,436.
Koniskiroku Photo Industry Co., Ltd.: *See—*
Sato, Shui; Hanzawa, Teruo; Furuya, Masaaki; Endo, Takaya; and Inoue, Isaburo, 3,770,446.
Koo, James Teh-Zen: *See—*
Boll, Harry Joseph; Heightley, John Donnell; Koo, James Teh-Zen; Lynch, William Thomas; Nelson, James Thomas; Bard, Richard; Waaben, Sigurd Gunther; and Waggener, Herbert Atkin, 3,771,147.
Koons, Edwin Russell, to Mallory, P. R., & Co., Inc. Method of making a metal-to-glass-to-ceramic seal. 3,770,404, Cl. 65-59.000.
Kornblum, Nathan, to Purdue Research Foundation. Olefin preparation. 3,770,843, Cl. 260-677.00r.
Kornrumpf, William P.; and Harnden, John D., Jr., to General Electric Company. Reliable solid state induction cooking appliance with control logic. 3,770,928, Cl. 219-10.490.
Korper, George W., III, to Conservor, Inc. Low pollution, high efficiency prime mover system and process. 3,769,788, Cl. 6-19.000.
Koster, Wolfgang; and Jentzsch, Harald, to Stork Amsterdam N.V. Apparatus for forming and conveying vertical loops in a strip of a material. 3,770,174, Cl. 226-107.000.
Kostko, Nicholas M. Cooking vessel. 3,769,899, Cl. 99-324.000.
Kouwenhoven, Herman W.: *See—*
Dautzenberg, Frits M.; Kouwenhoven, Herman W.; and Naber, Jaap E., 3,770,647.
Kovalkov, Gely Alexeevich; and Veselova, Olga Vladimirovna. Apparatus for control of the rotary rectifier of a synchronous machine. 3,770,999, Cl. 310-165.000.
Kowalski, Werner: *See—*
Muller, Fritz; Queck, Robert; Koch, Josef; Kowalski, Werner; Nolden, Werner; Selbsi, Gunter; and During, Helmut, 3,770,207.
Kozak, Larry M.; and Southern, Raymond L., to Allegheny Ludlum Industries, Inc. Method of roll pressure bonding stripes to a substrate. 3,769,687, Cl. 29-471.100.
Kozinczuk, Orest A., to Vischer Products Company. Steam pressure cooker. 3,769,958, Cl. 126-20.000.
Kraft, Robert E., to FMC Corporation. Screw conveyor shaft supporting structure. 3,770,109, Cl. 198-213.000.
Krakow, Burton, to Honeywell Inc. Infrared radiation detection by a matched system. 3,770,958, Cl. 250-339.000.
Kralowetz, Bruno; Braunwieser, Johann; and Reznar, Josef, to GFM Gesellschaft fur Fertigungstechnik und Maschinenbau Aktiengesellschaft. Swaging die. 3,769,825, Cl. 72-76.000.
Kramer, Daniel E. Refrigeration systems with elevated receivers. 3,769,808, Cl. 62-115.000.
Kramer, James H., to Goodrich, B. F., Company, The. Vehicle suspension. 3,770,291, Cl. 280-124.00b.
Kramer, Josef: *See—*
Borck, Joachim; Dahm, Johann; Hovy, Jan Willem; Kramer, Josef; and Wild, Albrecht, 3,770,748.
Kranz, Ray E., to Salem Corporation. Simultaneous production of metallized ores and coke. 3,770,417, Cl. 75-34.000.
Kranz, Walter, to Bolkow Gesellschaft mit beschrankter Haftung. Control device for adjusting a pendulum control of a flying body. 3,770,226, Cl. 244-3.210.
Kraus, Thaddaus; Paesold, Gerold; and Metzler, Elmar, to Balzers Patent und Beteiligungs Aktiengesellschaft. Arrangement for determining the constituents of a gas mixture. 3,769,837, Cl. 73-23.000.
Kraus, Walter R.: *See—*
Kelch, David J.; Kraus, Walter R.; and Clark, Jack D., 3,770,608.
Krause, John Thorvald; and Kurkjian, Charles Robert, to Bell Telephone Laboratories, Incorporated. Ultrasonic devices using germanium-containing chalogenide glasses. 3,771,073, Cl. 333-30.00r.
Krekeler, Claude B., to Cincinnati Mine Machinery Co., The. Means for removal and installation of bits in mining machinery. 3,769,683, Cl. 29-267.000.
Kreuz, John Anthony: *See—*
Dunphy, James Francis; Kreuz, John Anthony; and Roper, Don Albert, 3,770,573.
Krieger, Friedrich; Wirbser, Oskar; and Pfeiffer, Albert, to Siemens Aktiengesellschaft. Contact members for soldering electrical components. 3,770,874, Cl. 174-68.500.
Krimm, Heinrich: *See—*
Boie, Immo; Schulte, Walter; Pelz, Willibald; Krimm, Heinrich; Freitag, Dieter; and Nittel, Fritz, 3,770,447.
Krishna, Surinder: *See—*
Davis, John R.; and Krishna, Surinder, 3,771,028.
Kritshe, Victor J. Cue tip dressing device. 3,769,760, Cl. 51-204.000.
Kroll, Wolfram R., to Esso Research and Engineering Company. Hydrogenation process. 3,770,772, Cl. 260-332.100.
Kruger, William P.: *See—*
Burgwald, Glenn M.; Kruger, William P.; and Hammond, Donald L., 3,771,066.
Kruglinski, Frank A.: *See—*
Miller, Joseph A.; Kruglinski, Frank A.; and Freakes, Anthony, 3,769,777.
Kruithof, Albert: *See—*
Kobus, Stanislas; Kruithof, Albert; and Viellevoyl, Lucien Nicolas Leon, 3,770,899.
Krupka, Dan Charles: *See—*
Chen, Yen-Sun; Fukui, Hatsuaki; Gordon, Eugene Irving; Krupka, Dan Charles; and Rowen, John Howard, 3,771,008.
Krupp, Roy Stephen; and Tomko, Lawrence Andrew, to Bell Telephone Laboratories, Incorporated. Dynamically switching time slot interchanger. 3,770,895, Cl. 179-15.0aq.
Kubota, Yasuharu: *See—*
Kurolawa, Hiromichi; and Kubota, Yasuharu, 3,770,881.
Kuehl, Guenther L.; and Depietro, Alfonso, to Guenther Systems, Inc. Platform assembly for multiple chain transport device. 3,770,106, Cl. 198-154.000.
Kuhlow, Burkhard; Polte, Arnold; and Michels, Alfred, to Chemische Werke Huls Aktiengesellschaft. Process for the production of open-cell soft foam materials from vinyl chloride polymer plastisol. 3,770,670, Cl. 260-2.50p.
Kuhn, Karl, to Societe d'Etudes de Machines Thermiques. Crank case for an internal combustion engine or the like. 3,769,953, Cl. 123-195.00r.
Kulik, John J.: *See—*
Curran, William J.; and Kulik, John J., 3,770,884.
Curran, William J.; and Kulik, John J., 3,770,885.
Kupcikevicius, Vytautas, to Union Carbide Corporation. Cutboard spanning shouldered wickets. 3,770,134, Cl. 211-57.000.
Kupersmit, Julius B. Collapsible shipping container. 3,770,186, Cl. 229-23.00r.
Kupper, Willi, to Schlafhorst, W., & Co. Device for readying the unwinding process of cops. 3,770,220, Cl. 242-35.60e.
Kuraray Co. Ltd.: *See—*
Hirano, Yutaka; Yamane, Tadayuki; and Matsumoto, Syozi, 3,770,861.
Kurczyk, Heinz Georg: *See—*
Wuhrer, Josef; Kurczyk, Heinz Georg; and Ottenheym, Adrian, 3,770,475.
Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*

Enomoto, Satoru; Wada, Hisayuki; Fujioka, Mikio; and Koguro, Masao, 3,770,645.
Hayashi, Yasuo; Kodama, Kenji; Ohta, Minoru; and Saito, Shigeru, 3,770,386.

Kurenkov, Ivan Ivanovich: *See—*
Kassir, Gennady Andreevich; Temnikov, Evgeny Markovich; Umrilov, Nikolai Fedorovich; Kurenkov, Ivan Ivanovich; Lukyanchikov, Vyacheslav Grigorievich; Guryanov, Viktor Artemievich; Ivashkin, Vasily Alexeevich; and Serov, German Vasilievich, 3,770,212.

Kurimoto, Kozo; Watanabe, Sosuke; and Uchida, Hiroyasu, to Hitachi, Ltd. Recorder ink supplying apparatus. 3,771,165, Cl. 346-140.000.

Kurkjian, Charles Robert: *See—*
Krause, John Thorvald; and Kurkjian, Charles Robert, 3,771,073.

Kurolawa, Hiromichi; and Kubota, Yasuharu, to Sony Corporation. Color television camera. 3,770,881, Cl. 178-5.4st.

Kurz, John C. Method of fire damper fabrication. 3,769,684, Cl. 29-412.000.

Kwake, John P. Air inflatable structure. 3,769,763, Cl. 52-2.000.

Kyowa Hakko Kogyo Co., Ltd.: *See—*
Sumikawa, Shozo; Mohri, Ikuji; and Miyaji, Masayuki, 3,770,807.

La Fermeture Ailee: *See—*
Lacam, Guy, 3,770,552.

Labana, Santokh S.; and Chang, Yun F., to Ford Motor Company. Self-crosslinking powder containing carboxy and epoxy groups admixed with a flow control agent. 3,770,848, Cl. 260-836.000.

Labbe, Francis Auguste Maurice; Preston, Edward George; and Marritt, Clifford Russell, to Molins Limited. Cigarette making machines. 3,769,989, Cl. 131-21.00d.

Laboratories Roger Bellon: *See—*
Pesson, Marcel; and Techer, Henri, 3,770,734.

LaCalhene: *See—*
Saint-Martin, Bernard, 3,769,972.

Lacam, Guy, to La Fermeture Ailee and Avenue du General Leclerc. Device for cutting and forming stop connections for a sliding fastener continuously sewn on a series of workpieces. 3,770,552, Cl. 156-510.000.

Lademann, Ernest E.; and O'Connor, James J., to Bendix Corporation, The. Method of manufacturing a photoetched induction coil. 3,769,698, Cl. 29-602.000.

Ladin, Eli M., to Federal-Mogul Corporation. High speed air pressure sensitive seal and bearing system. 3,770,991, Cl. 308-187.100.

Laferty, John M.: *See—*
Kim, Tai K.; Paganozzi, L. Rita; MacInnis, Martin B.; and Laferty, John M., 3,770,869.

Lagier, Francois: *See—*
Lorinet, Jean-Paul Philippe; Lagier, Francois; and Bobineau, Bernard, 3,769,914.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See—*
Boissin, Jean-Claude; and Thibault, Jean-Jacques, 3,769,806.

Lake, James L.; Litz, John E.; Coleman, Robert B.; Goldenberg, Marcel; and Vojkovic, Milos, to Continental Ore Corporation. Recovery of rhenium and molybdenum values from molybdenite concentrates. 3,770,414, Cl. 75-1.000.

Lake, William H.: *See—*
Medendorp, Nicholas W.; and Lake, William H., 3,771,018.

Lale-Demoz, Roger, to Bobst, J., & Fils, S.A. Strip feed mechanism for a platen press. 3,770,175, Cl. 226-110.000.

Lamb, Leo M.: *See—*
Hall, Joseph J.; and Lamb, Leo M., 3,770,542.

Lamb, Robert M.: *See—*
Sipple, Lloyd H.; Hughson, Oliver J.; and Lamb, Robert M., 3,771,151.

Laminex, Inc., mesne: *See—*
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Lamson & Sessions Co., The: *See—*
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Lancaster, John Edgar: *See—*
Borders, Donald Bruce; and Lancaster, John Edgar, 3,770,773.

Lancaster, Raymond E.: *See—*
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Landow, Edwin S.: *See—*
Gutschick, Lester C.; and Landow, Edwin S., 3,770,889.

Lane, William Patrick, to Polaroid Corporation. Seating arrangement for a relecting member. 3,769,892, Cl. 95-42.000.

Lanes, Albert. Optical flashing light simulator and alerting device. 3,771,123, Cl. 340-104.000.

Lang, Albert F. Chum dispensing device. 3,769,740, Cl. 43-44.990.

Langer, Arthur W., Jr.; and Whitney, Thomas A. Separation and purification of chelating agents. 3,770,827, Cl. 260-563.00r.

Langley, Robert; Richards, Ronald Francis John; and Warwick, William Gill, to Ciba-Geigy AG. Process for preparing phthalocyanine blue pigments. 3,770,474, Cl. 106-288.00q.

Lanier Electronic Laboratory, Inc.: *See—*
Bolick, Fred C., Jr., 3,771,164.

Lantier, Maurice, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Logical call fee determination device for use with telegraphic equipment. 3,770,880, Cl. 178-2.00f.

Larsen, Arthur Lee, to Marathon Oil Company. Film forming hydrazine-containing corrosion inhibitor. 3,770,055, Cl. 166-244.00c.

Larsen, Henry A., to Arrowmatic, Inc. Remote control target apparatus. 3,770,914, Cl. 191-12.20a.

Lauener, W. F., AG: *See—*
Lauener, Wilhelm Friedrich, 3,769,826.

Lauener, Wilhelm Friedrich, to Lauener, W. F., AG. Apparatus for rolling metal strip. 3,769,826, Cl. 72-191.000.

Laurent, Henry: *See—*
Hofmeister, Helmut; Laurent, Henry; Prezewowsky, Klaus; Wiechert, Rudolf; and Steinbeck, Hermann, 3,770,726.

Laurent, Jean, to Institut Francais du Petrole des Carburants et Lubrifiants. Device for generating acoustic waves by implosion. 3,770,080, Cl. 181-.50h.

Laverick, Elizabeth, to Elliott Brothers (London) Limited. Radio aerial. 3,771,160, Cl. 343-756.000.

Law, Harold Bell, to RCA Corporation. Method for making an image screen structure for an apertured-mask cathode-ray tube using a mask having temporary apertures. 3,770,434, Cl. 96-36.100.

Lawrence, Eileen M.: *See—*
Lawrence, Richard E., 3,769,923.

Lawrence, Richard E.; deceased (by Lawrence, Eileen M.; executor). Sectionalized metal stack for high temperature service. 3,769,923, Cl. 110-184.000.

Lawrence, Walter W., Jr.; Mc Kay, Tom W.; and Wiegand, Karl E., to Ethyl Corporation. Cyanohydrin compounds. 3,770,796, Cl. 260-465.400.

Lawrenson, Jack: *See—*
Robinson, Albert Sidney; Loukes, David Gordon; and Lawrenson, Jack, 3,770,406.

Lawrenson, Jack, to Pilkington Brothers, Limited. Glass manufacturing methods. 3,770,407, Cl. 65-99.00a.

Lazar, Ferenc: *See—*
Kapolyi, Laszlo; Lazar, Ferenc; Vamos, Gyorgy; and Galauner, Bela, 3,770,469.

Lazko, Viktor Evgenievich: *See—*
Belenky, Alexandr Mikhailovich; Lazko, Viktor Evgenievich; Toschev, Mikhailovich; Bikmametov, Ilgiz Ganeevich; Vilkov, Vladimir Kirillovich; Mosendz, Nikolai Alexandrovich; Yakushina, Galina Mikhailovna; and Mikhailov, Mikhail Vasilievich Poplavko, 3,770,45.

Le Page, Jean Francois: *See—*
Derrien, Michel; van Landeghem, Hugo; JeanJean, Pierre; and Le Page, Jean Francois, 3,770,619.

Le Von, Ernest F.: *See—*
Cusic, John W.; and Le Von, Ernest F., 3,770,763.

Lean, John Barry: *See—*
Swinkels, Dominicus Adrianus Johannes; Scaife, Peter Hansen; and Lean, John Barry, 3,770,868.

Lear Siegler, Inc.: *See—*
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Leavitt, Julian J.: *See—*
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Lectro Precision Tolls, Inc.: *See—*
Greeninger, Marvin J., 3,769,823.

Lee, Henry L., Jr.; Stoffey, Donald G.; Stang, Albert F.; and Orlowski, Jan Alexander. Diacrylate esters of hydrogenated bis-phenol and tolylene. 3,770,811, Cl. 260-486.00r.

Lee, Raymond, Organization, Inc., The: *See—*
Dugan, Robert; and Boone, Shelby J., 3,769,955.
Manuel, Charles, 3,770,121.
Takayama, James, 3,770,311.
Winkler, John A., 3,769,734.

Leeds & Northrup Company: *See—*
Fertik, Harry A.; and Ross, Charles W., 3,770,946.
Ross, Charles W., 3,771,167.

Legorreta-Sanchez, Gilardo. Method and apparatus for automatically classifying complex, microscopic particles such as human cells. 3,770,349, Cl. 356-73.000.

Leiono, Robert: *See—*
Vandervelden, Cornelius Keith; and Leiono, Robert, 3,770,963.

Lengnick, Guenther Fritz; and Martin, Eugene Ray, to Stauffer Chemical Company, mesne. Curable organopolysiloxanes. 3,770,847, Cl. 260-827.000.

Lenski, Robert J., to Sundstrand Corporation. Burner control. 3,770,365, Cl. 431-79.000.

Lenz, Hans; Kolbe, Joachim; Marzolph, Herbert; and Bernklau, Kurt, to Bayer Aktiengesellschaft. Non-adhesive, highly elastic elastomer threads. 3,770,495, Cl. 117-138.80d.

Leonard, Henry K.: *See—*
Gach, Peter P.; and Leonard, Henry K., 3,770,153.

Lepere, Louis Jules. Enamel to be applied on natural or artificial teeth. 3,770,473, Cl. 106-220.000.

Lepselter, Martin P., to Bell Telephone Laboratories, Incorporated. Schottky barrier diodes as impedance elements and method of making same. 3,770,606, Cl. 204-192.000.

Lequin, Doris S.: *See—*
Schoolar, Richard B.; Lequin, Doris S.; Mathews, Harry E., Jr.; and Culpepper, Ronald N., 3,770,565.

Les Applications Industrielles Vosgiennes, SAPIVOG: *See—*
Pierron, Claude Raymond, 3,769,635.

Leschanz, Karl: *See—*
Peyser, Leonard F.; and Leschanz, Karl, 3,770,975.

Leslie, Victor Jeffrey; and Rose, John Brewster, to Imperial Chemical Industries Limited. Aromatic sulphones. 3,770,832, Cl. 260-607.00a.

Lettman, Klaus T., to High Performance Products, Inc. Canoe kneeseat. 3,769,645, Cl. 9-7.000.

Levacher, Friedrich; Dornseifer, Karl; Nolting, Karl-Heinz; Frielingsdorf, Helmut; and Kirch, Hans-Joachim, to Felten & Guilleaume Kabelwerke Aktiengesellschaft. Coupling unit to couple carrier frequencies from high voltage transmission lines. 3,771,069, C. 333-24.00c.

Lever Brothers Company: *See*—
Gast, David Barend, 3,770,459.

Lever, Reginald F.: *See*—
Demsky, Herbert M.; Dexter, Wilbur H.; Lever, Reginald F.; and Melzer, Paul A., 3,770,521.

Levine, Martin W.: *See*—
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Leviton Manufacturing Co., Inc.: *See*—
Poliak, John M., 3,770,920.

Lewis, Armand Francis: *See*—
Elder, Gerald Brent; and Lewis, Armand Francis, 3,770,560.

Lewis, Donald J., to Allied Chemical Corporation. Magnetic buckle switch. 3,770,919, Cl. 200-61.58b.

Lewis, Ebert E.: *See*—
Brown, Harry D., 3,770,419.

Lewis Engineering Company, The: *See*—
Edwards, Harrison F.; and Bottorf, Stewart F., 3,770,965.

Lewis, Geoffrey Arthur, to Lucas, Joseph, (Industries) Limited. Fuel supply systems for gas turbine engines. 3,769,791, Cl. 60-39.28r.

Lichte, Henry P., Jr.; and Lindsey, James M., to Sperry-Sun Well Surveying Company. Borehole orientation tool. 3,771,118, Cl. 340-18.00r.

Liejestrand, Walter E., to Smith International, Inc. Degassing apparatus. 3,769,779, Cl. 55-166.000.

Lightfoot, George L.: *See*—
Tolf, Ingvar L.; Herzing, Vernon J.; Miller, Everett L.; and Lightfoot, George L., 3,770,141.

Limberg, Donald R., to Metraflex Company, The. Unidirectional variable flow valve. 3,770,014, Cl. 137-614.200.

Linack, Manfred: *See*—
Ploch, Siegfried; Zeisberg, Peter; Gerischer, Heini; Hennig, Siegfried; Linack, Manfred; and Klinger, Kurt, 3,769,816.

Linde, Hans, to Berthold, H., AG, Firma. Device for exposure of photomaterial in hand-operated photocomposing devices. 3,769,885, Cl. 95-4.500.

Lindsay, Iain Hardy: *See*—
Clarke, Eric C.; and Lindsay, Iain Hardy, 3,769,709.

Lindsey, James M.: *See*—
Lichte, Henry P., Jr.; and Lindsey, James M., 3,771,118.

Ling, Andrew T., to Xerox Corporation. Operating conditions monitoring in digital computers. 3,771,131, Cl. 340-172.500.

Linhardt Hans D.; Kirk, James A.; and Lancaster, Raymond E., to Airco, Inc. Integrated system for vaporizing cryogenic liquids. 3,770,048, Cl. 165-1.000.

Link, Edwin A., to RTE Corporation. Fluid fuse. 3,771,089, Cl. 337-277.000.

Lippy Can Co., Ltd.: *See*—
Knize, Elmer J., 3,770,161.

List, Hans: *See*—
Feichtinger, Gerhard; and Skatsche, Othmar, 3,769,948.

Little, Robert E., to United States of America, National Aeronautics and Space Administration. Method of making pressure-tight seal for super alloy. 3,769,689, Cl. 29-498.000.

Litton Business Systems, Inc.: *See*—
McSweeney, William, 3,770,987.

Litton Industries, Inc.: *See*—
Sheets, Herbert D., Jr.; Meyer, Ronald A.; and O'Hara, Martin J., 3,770,401.

Litton Medical Products, Inc.: *See*—
Vandervelden, Cornelius Keith; and Leiono, Robert, 3,770,963.

Liz, John E.: *See*—
Lake, James L.; Litz, John E.; Coleman, Robert B.; Goldenberg, Marcel; and Vojkovic, Milos, 3,770,414.

Livitan, Maurice D. Packet-type laminating machine. 3,770,550, Cl. 156-498.000.

Llames, Emil C. Automatic water closet. 3,769,637, Cl. 4-64.000.

Lochet, Jean A.: *See*—
Bick, Maurice; and Lochet, Jean A., 3,770,596.

Lockhart, Hildred B.: *See*—
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Lockheed Aircraft Corporation: *See*—
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Forsyth, John P.; Forsyth, Robert W.; Holcomb, Donald R.; and Shiovitz, Nathan N., 3,770,060.
Stang, Paul F., 3,771,157.
Trasel, Johan; and Dupcak, Joseph D., 3,770,228.

Loesche, Victor E., Jr.: *See*—
Spain, Theodore H.; Geimer, Allen F. J.; and Loesche, Victor E., Jr., 3,769,742.

Lofquist, Alden A., Jr. Self-compensating diaphragm pump. 3,769,879, Cl. 92-84.000.

Logan, Lloyd L. Longitudinally adjustable trailer kingpin with hydraulic lock. 3,770,296, Cl. 280-407.000.

Logging Development Corporation: *See*—
Palfy, Robert Miklos, 3,770,030.

Lohr, Thomas E., to Allied Chemical Corporation. Pressure sensing apparatus. 3,771,121, Cl. 340-52.00r.

Long, Donald V.; Derby, Norwin Cedric; and Chorak, Peter P., to Dalpak Corporation, The. Shipping bag. 3,770,189, Cl. 229-53.000.

Lontai, Laszlo N.: *See*—
Nolan, John J.; Marston, Peter G.; and Lontai, Laszlo N., 3,770,629.

Loomba, Yogendra S., to Allied Chemical Corporation. Deflector. 3,770,387, Cl. 23-281.000.

Lopez, Manuel, to Roberk Company, The. Clip for windshield wiper blade refill. 3,769,653, Cl. 15-250.420.

Lorain Products Corporation: *See*—
Butler, Luther C., Jr., 3,770,982.

Lorentzen, Jurgen; Christiansen, Christian Verner; and Carlsen, Carl. Apparatus for freezedrying material with loading and discharging means. 3,769,717, Cl. 34-92.000.

Lores, Carlos; and Moore, Ralph Bishop, to Du Pont de Nemours, E. I., and Company. Process for removing dissolved lead compounds from aqueous media. 3,770,423, Cl. 75-108.000.

Lorinet, Jean-Paul Philippe; Lagier, Francois; and Bobineau, Bernard, to Gerin, Merlin, mesne. Speed synchronizing control arrangement for transport systems. 3,769,914, Cl. 104-148.01m.

Loshbough, Richard C., to Reliance Electric Company. Computer weigher system with intermediate calculation and display. 3,770,069, Cl. 177-1.000.

Loukes, David Gordon: *See*—
Robinson, Albert Sidney; Loukes, David Gordon; and Lawrenson, Jack, 3,770,406.

Louvat, Jules: *See*—
Jacquelin, Guy J.; Hampartzoumain, Robert; and Louvat, Jules, 3,770,126.

Lu, Yung-Cheh. Dial device for determining relationships such as chemical reactions. 3,769,728, Cl. 40-70.00r.

Lucas, George J., to Teletype Corporation. Masking for printed circuit photomasters. 3,769,895, Cl. 95-85.000.

Lucas, Joseph, (Industries) Limited: *See*—
Cardwell, John William, 3,770,916.
Lewis, Geoffrey Arthur, 3,769,791.

Lucas Radiator and Refrigeration, Inc.: *See*—
Crain, Norman R., 3,769,947.

Ludder, Rodney E.: *See*—
Amberg, Stephen W.; Amberg, Ralph G.; and Ludder, Rodney E., 3,770,860.

Lugo, Luigi: *See*—
Reni, Cesare; and Lugo, Luigi, 3,770,830.

Luinman, Paul A.; and Fischer, Thomas R., to Avco Corporation. Breakaway mechanical linkage. 3,769,847, Cl. 74-118.000.

Lukyanchikov, Vyacheslav Grigorievich: *See*—
Kassir, Gennady Andreevich; Temnikov, Evgeny Markovich; Umrilov, Nikolai Fedorovich; Kurenkov, Ivan Ivanovich; Lukyanchikov, Vyacheslav Grigorievich; Guryanov, Viktor Artemievich; Ivashkin, Vasily Alexeevich; and Serov, German Vasilievich, 3,770,212.

Lundberg, Robert Dean: *See*—
Koleske, Joseph Victor; Lundberg, Robert Dean; Pollart, Dale Flavian; and Smarook, Walter Henry, 3,770,564.

Luthmann, Reinhardt F.: *See*—
De Angelis, William M.; Luthmann, Reinhardt F.; Meehan, Charles A.; and Smith, M. Howe, 3,770,405.

Luvisi, Fred P.; Filachione, Edward M.; and Hopkins, William J., to United States of America, Agriculture. Process for lubricating leather. 3,770,372, Cl. 8-94.230.

Luxton, Robert A. Electrical power distribution. 3,771,097, Cl. 339-14.00p.

Lyman, John B.: *See*—
Robinson, James M.; and Lyman, John B., 3,769,809.

Lynch, William Thomas: *See*—
Boll, Harry Joseph; Heightley, John Donnell; Koo, James Teh-Zen; Lynch, William Thomas; Nelson, James Thomas; Bard, Richard; Waaben, Sigurd Gunther; and Waggener, Herbert Atkin, 3,771,147.

Lynn, John D.; and Sloughfy, James L., to Bethlehem Steel Corporation. Process for separating carbon from iron-bearing fines in blast furnace flue dusts. 3,770,213, Cl. 241-24.000.

M-Line, Inc.: *See*—
Martin, Gene L., 3,770,081.

Maan, Cornelis; Collaris, Maria Antonius Alphonsus Andreas; and Coenen, Renier Gertruda Hubertus, to U.S. Philips Corporation. Method of electrocoating a heating member with a dark-coloured insulating layer and heating member for an indirectly heated cathoe manufactured by said method. 3,770,601, Cl. 204-181.000.

Macaulay, William R.: *See*—
Bergum, Bernard C.; Bilhorn, John M.; Kenyon, Kenneth H.; Macaulay, William R.; and Youngquist, John A., 3,770,505.

Machlett Laboratories, Incorporated: *See*—
Randmer, Jacob A., 3,770,934.

Machlett Laboratories, Incorporated, The: *See*—
Peyser, Leonard F.; and Leschanz, Karl, 3,770,975.

MacInnis, Martin B.: *See*—
Kim, Tai K.; Paganozzi, L. Rita; MacInnis, Martin B.; and Laferty, John M., 3,770,869.

Mack, Alfred: *See*—
Butler, Jaguith Gould; and Mack, Alfred, 3,771,059.

Mackay, Patrick W.: *See*—
Celada, Juan; Mackay, Patrick W.; Garcia, Gilberto Guerra; Martinez, Enrique R.; and Villasenor, Antonio, 3,770,421.

Mackles, Leonard, to Bristol-Myers Company. Anhydrous aerosol foam. 3,770,648, Cl. 252-305.000.
MacMillan Bloedel, Limited: *See*—
Schilling, Walter W., 3,769,867.
Madden, Michael J. Anti-polluting filling and vapor recovery system. 3,770,028, Cl. 141-59.000.
Maeda, Kazuo: *See*—
Kito, Ryoichiro; Maeda, Kazuo; Osawa, Misumi; Hayasaka, Nobuo; Watanabe, Hisatsugu; and Akaike, Takenori, 3,770,147.
Maffii, Giulio: *See*—
Cavalleri, Bruno; Bellasio, Elvio; Testa, Emilio; and Maffii, Giulio, 3,770,803.
Mageli, Orville Leonard; and McKellin, Wilbur H., to Pennwalt Corporation. Certain peroxyesters having a defined substituent positioned on a carbon atom at least beta to a peroxy carbon atom. 3,770,770, Cl. 260-327.00h.
Magnetic Engineering Associates, Inc.: *See*—
Nolan, John J.; Marston, Peter G.; and Lontai, Laszlo N., 3,770,629.
Mahogany Farms, Inc., mesne: *See*—
Garnett, Donald W., 3,770,458.
Maier, Eberhard; Endler, Walter; and Haack, Paul, to Siemens Aktiengesellschaft. Coaling installation for power plants. 3,770,217, Cl. 241-135.000.
Maier, Ludwig, to Monsanto Company. Tris-(3-halo-2-hydroxypropyl)-hydroxy-methylphosphonium chloride. 3,770,831, Cl. 260-606.50f.
Majewski, Theodore E.; and Easterly, James P., to Dow Chemical Company, The. Salicylic acid and halo-substituted salicylic acid salts of oxydianiline. 3,770,814, Cl. 260-501.180.
Makela, Leo. Sliding door consisting of one of several separate doors. 3,769,749, Cl. 49-130.000.
Makino, Kiyoji: *See*—
Akiyama, Keiiti; and Makino, Kiyoji, 3,770,705.
Makisumi, Yasuo, to Shionogi & Co., Ltd. 2-Lower alkyl-2,3-dihydrothieno[3,2-c]quinoline dioxides and pharmaceutically acceptable non-toxic salts thereof. 3,770,744, Cl. 260-283.00s.
Makisumi, Yasuo, to Shionogi & Co., Ltd. 2-Lower alkyl-2,3-dihydrothieno[3,2-c]quinoline dioxides and pharmaceutically acceptable non-toxic salts thereof. 3,770,745, Cl. 260-283.00s.
Makwinski, John A.; Rehman, Warren C.; and Spotholz, Clifford H., to General Foods Corporation. Method of making pelletized coffee precolator package. 3,770,457, Cl. 426-394.000.
Mallory, P. R., & Co., Inc.: *See*—
Koons, Edwin Russell, 3,770,404.
Murray, Stephen F.; and Simmons, Harold T., 3,771,102.
Malloy, John F.: *See*—
Gladstone, Matthew T.; and Malloy, John F., 3,770,555.
Mammino, Joseph; and Jvirblis, Gail D., to Xerox Corporation. Photoelectrosolographic imaging process. 3,770,430, Cl. 96-1.00r.
Manuel, Charles, 20% interest to Lee, Raymond, Organization, Inc., The. Bank coin pack. 3,770,121, Cl. 206-.820.
Marand, Jean, to Ciba-Geigy Corporation. Seal for aerosol dispenser. 3,770,166, Cl. 222-145.000.
Marathon Oil Company: *See*—
Burdge, David N., 3,770,649.
Larsen, Arthur Lee, 3,770,055.
Marcade, Roque D.: *See*—
Janke, Donald E.; Marcade, Roque D.; and Karklys, Joseph, 3,769,716.
Marchini, Dino: *See*—
Camiciottoli, Roberto; and Marchini, Dino, 3,770,913.
Marcotte, Alfred J., Jr.: *See*—
Watts, Eugene R. V.; and Marcotte, Alfred J., Jr., 3,771,156.
Marcus, Bruce D.: *See*—
Kirkpatrick, Milton E; Piwonka, Thomas S.; and Marcus, Bruce D., 3,770,047.
Marek, Alois, to Brown, Boveri & Company Limited. Bistable semiconductor device. 3,771,027, Cl. 317-235.00r.
Maries, Keith; and Case, Derek Frank, to International Computers, Limited. Method of making magnetic head assembly having glass ceramic bonded parts. 3,770,403, Cl. 65-43.000.
Marinaccio, Richard E., to Westinghouse Electric Corporation. Electronically variable beamwidth antenna. 3,771,163, Cl. 343-854.000.
Marking Systems, Inc., mesne: *See*—
De Hart, Guy K.; De Hart, Louis K.; and Clark, Ruel R., 3,770,093.
Markowitz, Marvin R. Brassiere construction. 3,769,987, Cl. 128-484.000.
Marks, Colin Elliott; and Smith, Michael Arthur, to Fisons Limited. Hydrazides. 3,770,738, Cl. 260-250.00a.
Marquis, Edward Thomas; and Brader, Walter Howe, Jr., to Jefferson Chemical Company, Inc. Alkyloxy acetic acid esters. 3,770,808, Cl. 260-484.00r.
Marritt, Clifford Russell: *See*—
Labbe, Francis Auguste Maurice; Preston, Edward George; and Marritt, Clifford Russell, 3,769,989.
Marsden, Ronald Eric, to Stricon Products Limited. Splicer for reinforcing bars. 3,769,678, Cl. 29-200.00b.
Marsh, Douglas D.; and Newlin, John C., to H & M Enterprises. Vertically adjustable support. 3,770,236, Cl. 248-408.000.
Marston, Peter G.: *See*—
Nolan, John J.; Marston, Peter G.; and Lontai, Laszlo N., 3,770,629.
Martin, Claude R., to Societe d'Etude et de Construction d'Appareils de Precision. Installations for printing codes on articles. 3,769,906, Cl. 101-91.000.
Martin, Don Leo; and Sarver, Jack Kenneth, to FMC Corporation. Ocean bottom well tubing valve installation. 3,770,053, Cl. 166-.500.
Martin, Eugene Ray: *See*—
Lengnick, Guenther Fritz; and Martin, Eugene Ray, 3,770,847.
Martin, Gene L., to M-Line, Inc. Silencer for combustion engines. 3,770,081, Cl. 181-36.00b.
Martin, Jack P.: *See*—
Gray, Thomas H.; and Martin, Jack P., 3,770,517.
Martin Marietta Corporation: *See*—
Cates, Harold T.; and Darling, Ray E., 3,769,693.
Haycock, John Norman; and Witten, Louis, 3,770,527.
Smart, Richard C.; and Swonger, Kenneth D., 3,769,974.
Martin Processing Company, Incorporated: *See*—
Hermes, Julius, 3,770,528.
Martin, Samuel W., to Pitney-Bowes, Inc. Multiple copy arrangement for photocopy machine. 3,770,348, Cl. 355-102.000.
Martin, Sylvia, to Oxy Metal Finishing Corporation. Acid zinc plating baths. 3,770,599, Cl. 204-55.00r.
Martin, William Edward, to RCA Corporation. Apparatus for remotely measuring the temperature and emissivity of a radiant object independent of the object's radiant surface property. 3,770,973, Cl. 250-340.000.
Martinez, Enrique R.: *See*—
Celada, Juan; Mackay, Patrick W.; Garcia, Gilberto Guerra; Martinez, Enrique R.; and Villasenor, Antonio, 3,770,421.
Maruyama, Eiichi: *See*—
Asai, Shojiro; and Maruyama, Eiichi, 3,771,026.
Maruyama, Isamu: *See*—
Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Horohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isamu; Mori, Minno Kazuo; and Kobayashi, Tsoyoshi, 3,770,767.
Marzinkewitsch, Rene: *See*—
Hirschfelder, Horst-Dieter; and Marzinkewitsch, Rene, 3,770,025.
Marzolph, Herbert: *See*—
Lenz, Hans; Kolbe, Joachim; Marzolph, Herbert; and Bernklau, Kurt, 3,770,495.
Maschinenfabrik Gehring K.G.: *See*—
Gehring, Christoph W.; Scholz, Egbert; and Strauss, Wolfgang, 3,770,610.
Maschinenfabrik Winkler, Fallert & Co., AG: *See*—
Heimlicher, Paul; and Streit, Hans, 3,769,910.
Maschinenfabrik zum Bruderhaus G.m.b.H.: *See*—
Hornung, Hans, 3,769,868.
Mascitti, Albert A.: *See*—
Sulkowski, Theodore S.; and Mascitti, Albert A., 3,770,766.
Mashikian, Matthew S.; Kelley, James K.; and McMurray, William C., to Detroit Edison Company, The. Capacitively graded electrical insulating devices. 3,770,877, Cl. 174-143.000.
Masic, Rene: *See*—
Kervizic, Jacques; Masic, Rene; and Warnecke, Robert Jean, 3,770,870.
Massarani, Elena: *See*—
Sianesi, Enrico; Da Re, Paolo; Setnikar, Ivo; and Massarani, Elena, 3,770,733.
Massey, James A. Process for securing a head to a container. 3,769,686, Cl. 29-470.500.
Masterson, Mary: *See*—
Masterson, William Charles; and Wilbert, Michael E., 3,769,723.
Masterson, William Charles; deceased (by Masterson, Mary; executrix); and Wilbert, Michael E. Athletic footwear. 3,769,723, Cl. 36-2.50r.
Masucci, Alan A. Adjustable bifocal spectacles. 3,770,343, Cl. 351-55.000.
Mathews, Harry E., Jr.: *See*—
Schoolar, Richard B.; Lequin, Doris S.; Mathews, Harry E., Jr.; and Culpepper, Ronald N., 3,770,565.
Matsui, Atsuro: *See*—
Ichiki, Eiichi; Iida, Kazuo; Matsui, Atsuro; and Kadokura, Hidekimi, 3,770,789.
Matsui, Kazumi; and Umemori, Takashi, to Japanese National Railways. Apparatus for propelling a movable body in a suspended state at a very high speed. 3,771,033, Cl. 318-135.000.
Matsumoto, Akio; Tonogai, Seinosuke; and Morishita, Kosaku, to New Nippon Electric Company Ltd. Socket suited for revolving the lamp attached thereto. 3,771,106, Cl. 339-52.000.
Matsumoto, Jon-Ichi; Sekine, Yutaka; Takase, Yoshiyuki; and Nakamura, Shinichi, to Dainippon Pharmaceutical Co., Ltd. 2-(Substituted pyrrolidino)-8-lower alkyl-5,8-dihydro-5-oxopyrido-[2,3-d]-pyrimidine-6-carboxylic acid derivatives, and process for the prparation of the same. 3,770,742, Cl. 260-256.40f.
Matsumoto, Seiji, to Xerox Corporation. Copying apparatus with auxiliary light source for illuminating an original to be reproduced. 3,771,082, Cl. 355-76.000.
Matsumoto, Syozi: *See*—
Hirano, Yutaka; Yamane, Tadayuki; and Matsumoto, Syozi, 3,770,861.
Matsuno, Shigetoshi: *See*—

Tamura, Kohzoh; and Matsuno, Shigetoshi, 3,770,020.

Matsuo, Shunji: *See—*
Fujiwhara, Mitsuto; Sato, Ryosuke; Koga, Tadaaki; and Matsuo, Shunji, 3,770,436.

Matsuo, Toshiaki: *See—*
Chono, Koji; and Matsuo, Toshiaki, 3,770,664.

Matsushima, Miroshi, to Nishimatsu Construction Company Limited. Method of controlling the water head of the working face in the shield method of construction. 3,769,804, Cl. 61-85.000.

Matsushima, Shunsuke, to Sumitomo Chemical Co., Ltd. Method for preparing cyclododecatriene-1,5,9. 3,770,839, Cl. 260-666.00b.

Mattel, Inc.: *See—*
Prodger, Brian S.; Parker, John C.; Bosley, Denis V.; and Toy, Raymond M., 3,769,746.
Sloane, Thomas E., Jr.; Hart, William; and Pester, William B., 3,769,744.

Matthews, Robert R.: *See—*
Campbell, David W.; and Matthews, Robert R., 3,770,056.

Matzner, Markus; McGrath, James E.; and Noshay, Allen, to Union Carbide Corporation. Lactam-vinyl block copolymers. 3,770,849, Cl. 260-857.00g.

Mausner, Marvin: *See—*
Benson, Albert; Mausner, Marvin; and Carasik, William, 3,770,855.

Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V.: *See—*
Seidel, Kathe, 3,770,623.

Maxwell, Reginald R.: *See—*
Zell, Robert M.; and Maxwell, Reginald R., 3,770,243.

May, Carl Jerome, Jr., to Bell Telephone Laboratories, Incorporated. Automatic transmission line testing system. 3,770,894, Cl. 179-15.0bf.

Mayer, Edward A., to Texaco Inc. Automatic fuel dispensing nozzle. 3,770,029, Cl. 141-128.000.

Mayer, Siegfried; Janke, Bernhard; and Frach, Werner, to Aug/Winkhaus. Door or window with fluid-operated seal. 3,769,750, Cl. 49-477.000.

Mayo, Marvin J., to Altair Scientifics, Inc. Method for controlled lapping of optical surfaces to correct deviations from desired contours. 3,769,762, Cl. 51-284.000.

Maytag Company, The: *See—*
Davis, Gordon Jerry, 3,770,001.
McNally, William J., 3,770,980.

Mazet, Guy: *See—*
Cros, Georges; and Mazet, Guy, 3,770,595.

MB Associates: *See—*
Dettling, Joseph R.; Farnham, John F., Jr.; and Gaines, Stephen T., 3,771,152.

Mc Bride, Lemuel R.: *See—*
Wehr, Robert L.; Rearick, Edward W., Jr.; and Mc Bride, Lemuel R., 3,770,266.

Mc Hugh, James Dennis, to General Electric Company. Self-pressurizing seal for rotary shafts. 3,770,179, Cl. 277-2.000.

Mc Kay, Tom W.: *See—*
Lawrence, Walter W., Jr.; Mc Kay, Tom W.; and Wiegand, Karl E., 3,770,796.

McBride, Lemuel R.: *See—*
Carothers, David B.; Rearick, Edward W.; and McBride, Lemuel R., 3,770,173.

McCarthy, Marion S. Exercising machine having plural exercising implements thereon. 3,770,267, Cl. 272-58.000.

McCaul, Edward W., to Webb, Jeris B., Company. Article sorting apparatus. 3,770,100, Cl. 198-38.000.

McCloud, Robert A. Winch mechanism. 3,770,244, Cl. 254-164.000.

McCoy, Lowell R., to Rockwell International Corporation. Apparatus and method for removing solids from liquids. 3,770,605, Cl. 204-188.000.

McCully, Joseph B., to Midland-Ross Corporation. Annealing lehr. 3,770,408, Cl. 65-162.000.

MCD Corporation: *See—*
Thomas, Michael D., 3,770,113.

McDole, Ewell E.; and Howard, Frank L., to Kaiser Aluminum & Chemical Corporation. Dispersion for hot rolling aluminum products. 3,770,636, Cl. 252-49.500.

McDonald, Alexander, to Blastmaster Company, a division of Tekobogy, Limited. Apparatus for shot blasting work members. 3,769,752, Cl. 51-5.000.

McDonald, Guy Douglas: *See—*
Weissman, Eugene Yehuda; McDonald, Guy Douglas; and Weinlein, Conrad Eugene, 3,770,507.

McDonald, Joseph A. Vibratory stone polisher. 3,769,758, Cl. 51-163.000.

McDonnell Douglas Corporation: *See—*
Gibson, James O.; Schumacher, Robert L.; and Gore, Thomas W., 3,770,487.

McDonough, Robert P.: *See—*
Connor, Dale C.; and McDonough, Robert P., 3,770,984.

McElroy, James A. Cable draw mechanism. 3,770,233, Cl. 248-55.000.

McErlane, James E.: *See—*
Carter, Elbert P.; Johnson, Donald R.; McErlane, James E.; Nadeau, Richard G.; and Nieuweboer, Gerrit, 3,770,382.

McEvoy, James L.: *See—*
Cosgrove, Lee A.; and McEvoy, James L., 3,770,659.

McFarling, James L., to Owens-Corning Fiberglass Corporation. Polyurethanes produced oxyalkylated resoles. 3,770,671, Cl. 260-2.5ap.

McGrath, James E.: *See—*
Matzner, Markus; McGrath, James E.; and Noshay, Allen, 3,770,849.

McGrath, Patrick John. Toilet article. 3,769,991, Cl. 132-84.00r.

McGraw-Edison Company: *See—*
Hendren, Charles W., 3,770,148.

McGuire, Wayne. Automatic shifting means for multispeed bicycles. 3,769,848, Cl. 74-217.00b.

McIntosh, Harold A., to Robertshaw Controls Company. Sequential loading system having auxiliary switches. 3,770,977, Cl. 307-41.000.

McKay, Robert Bruce, to Ciba-Geigy AG. Process for the production of flocculation resistant pigments. 3,770,476, Cl. 106-309.000.

McKay, William P.: *See—*
Ansevin, Ronald W.; Avetta, Edward D.; and McKay, William P., 3,770,969.

McKellin, Wilbur H.: *See—*
Mageli, Orville Leonard; and McKellin, Wilbur H., 3,770,770.

McKibben, James W.; Goodman, Brian L.; and Higgins, Robert B., to Ecodyne Corporation. Method for treating water containing suspended solids from a sanitary system. 3,770,624, Cl. 210-8.000.

McKown, Howard P., Jr., to Breeze Corporation, Inc. Variable length trangential worm driven clamp. 3,769,665, Cl. 24-274.00r.

McLinden, Hugh F., Jr. Simulated submarine target apparatus. 3,771,115, Cl. 340-5.00d.

McLoughlin, Joseph R., to General Electric Company. Curable composition comprising carbon fibers and a mixture of aliphatically unsaturated imides. 3,770,691, Cl. 260-37.00n.

McMahon, Donald H., to Sperry Rand Corporation. Coherent optical processor fingerprint identification apparatus. 3,771,124, Cl. 340-146.30e.

McMahon, Donald H., to Sperry Rand Corporation. Optical processor fingerprint identification apparatus. 3,771,129, Cl. 340-146.30e.

McMahon, Floyd J.: *See—*
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McMullen, Frederick G. Waste materials processing system. 3,769,921, Cl. 110-8.00r.

McMullen, James Michael: *See—*
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McMurray, William C.: *See—*
Mashikian, Matthew S.; Kelley, James K.; and McMurray, William C., 3,770,877.

McMurtry, David Harwood, to International Business Machines Corporation. Optical bar coding scanning device. 3,770,942, Cl. 235-61.11e.

McNally, William J., to Maytag Company, The. Programmed cycle selection circuit. 3,770,980, Cl. 307-141.000.

McNeil Corporation: *See—*
Ireland, Newell J.; and Getz, Gary R., 3,770,858.

McPherson, Charles Q.: *See—*
Colburn, Steven C.; McPherson, Charles Q.; and Miller, Roger A., 3,770,335.

McRae, William V., Jr.; and Stuart, John J., Jr., to Transyt Corporation. High mass flow transportation system. 3,769,913, Cl. 104-88.000.

McSweeney, Daniel Robert; and Kandi, John Richard, to General Foods Corporation. Flavor enhancing composition for foodstuffs. 3,770,463, Cl. 426-212.000.

McSweeney, Gary J.: *See—*
Yungkurth, Donald G.; and McSweeney, Gary J., 3,770,432.

McSweeney, William, to Litton Business Systems, Inc. Extended range capacitive timing circuit. 3,770,987, Cl. 307-293.000.

Mcvey, Raymond L. Barium enema administration method and apparatus. 3,769,962, Cl. 128-2.00a.

McWhorter, Daniel M., to Kendall Company, The, mesne. Urinary catheter. 3,769,981, Cl. 128-349.00b.

Mead Corporation, The: *See—*
Kelch, David J.; Kraus, Walter R.; and Clark, Jack D., 3,770,608.

Mead Johnson & Company, mesne: *See—*
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Medendorp, Nicholas W.; and Lake, William H., to General Electric Company. Discharge lamp containing bridge rectifier. 3,771,018, Cl. 315-200.00r.

Medical Concepts, Inc.: *See—*
Karman, Harvey, 3,769,980.

Mee, John D.: *See—*
Jenkins, Philip W.; Heseltine, Donald W.; and Mee, John D., 3,770,451.

Meehan, Charles A.: *See—*
De Angelis, William M.; Luthmann, Reinhardt F.; Meehan, Charles A.; and Smith, M. Howe, 3,770,405.

Meharry, Roy H. Single disc corn stalk cutter. 3,769,783, Cl. 56-63.000.

Meier, Hans, to Vaillant, Joh., KG. Arrangement in a hot water-circulating heating system. 3,770,197, Cl. 237-8.00c.

Meijer, Robert S., to Alnor Instrument Company, Div. of Illinois Testing Laboratories, Inc. Voltage comparator structure and method. 3,770,985, Cl. 307-235.00r.

Meister, Jack B., to Integrated Electronics Corporation. Teaching system for keyboard devices. 3,769,719, Cl. 35-6.000.

Melbro Corporation: *See—*
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Melnick, Joseph L.: *See—*
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Melzer, Paul A.: *See—*
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Mende, Wilhelm & Co.: *See—*
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Menozzi, Milena: *See—*
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Mentone, Pat F., to Buckbee-Mears Company. Plating metal onto small flexibly based conductors. 3,770,594, Cl. 207-15.000.
Merav, Abraham Dov. Medical devices. 3,769,983, Cl. 128-351.000.
Merchant, Thomas Harry; Ward, Peter Thomas; and Terence, Richard, to Rubery, Owen & Co., Limited. Means for handling freight containers and the like. 3,770,309, Cl. 294-81.0sf.
Merck & Co., Inc.: *See—*
Inamine, Edward; and Birnbaum, Jerome, 3,770,590.
Milkowski, John D.; Veber, Daniel F.; and Hirschmann, Ralph F., 3,770,822.
Merck Patent Gesellschaft mit beschrankter Haftung: *See—*
Baumer, Wilhelm; Schmitt, Dieter; and Stein, Alfred, 3,770,379.
Borck, Joachim; Dahm, Johann; Hovy, Jan Willem; Kramer, Josef; and Wild, Albrecht, 3,770,748.
Gams, Erwin; Namenyi, Istvan; Wahlig, Helmut; Erdmann, Dietrich; and Koch, Wolfgang, 3,770,817.
Schmitt, Dieter; Stein, Alfred; and Baumer, Wilhelm, 3,770,381.
Merck Sharp & Dohme (I.A.) Corporation: *See—*
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Meridian Industries, Inc.: *See—*
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Merrell, Richard L.; Hewko, Lubomyr O.; and Kepple, Richard K., to General Motors Corporation. Transmission. 3,769,858, Cl. 74-752.00e.
Merren, Thomas Oliver, to Associated Electrical Industries, Limited. Mass spectrometry. 3,770,337, Cl. 50-282.000.
Mertzweiller, Joseph K.; and Tenney, Horace M., to Esso Research and Engineering Company. Hydrogenation of organic compounds. 3,770,844, Cl. 260-683.900.
Mestetsky, Thomas S., to GAF Corporation. Adhesive stick. 3,770,677, Cl. 260-28.50r.
Mestetsky, Thomas S., to GAF Corporation. Controlled release coating composition and process. 3,770,687, Cl. 260-30.4sb.
Metalem S.A.: *See—*
Feller, Gilbert, 3,769,676.
Metallurgesellschaft Aktiengesellschaft: *See—*
Dorschner, Oskar; Gross, Hans-Werner; and Hartmann, Rainer, 3,770,714.
Metcalfe, Joseph E., III: *See—*
Rightmire, Robert A.; Metcalfe, Joseph E., III; and Benak, James L., 3,770,506.
Metraflex Company, The: *See—*
Limberg, Donald R., 3,770,014.
Metzger, Sidney H., to Baychem Corporation, mesne. Stabilization of polyesterurethanes with 2-imino-oxazolidines. 3,770,693, Cl. 260-45.8nz.
Metzler, Elmar: *See—*
Kraus, Thaddaus; Paesold, Gerold; and Metzler, Elmar, 3,769,837.
Meyer, Engelbert A., to USM Corporation. Vinyl top retainer assembly. 3,769,662, Cl. 24-73.0hs.
Meyer, Fred J.: *See—*
Bremmer, Bart J.; and Meyer, Fred J., 3,770,576.
Meyer, Leo A.; and Perkins, Robert J., to Minnesota Mining and Manufacturing Company. Stabilized light-sensitive intermediate sheet. 3,770,442, Cl. 96-82.000.
Meyer, Ronald A.: *See—*
Sheets, Herbert D., Jr.; Meyer, Ronald A.; and O'Hara, Martin J., 3,770,401.
Meyer, Wilheilm. Foldable invalid chair. 3,770,073, Cl. 180-65.00r.
Meyers, Clyde C., Jr., to Mobil Oil Corporation. Separation of aromatic mixtures. 3,770,841, Cl. 260-668.00a.
MHI, Inc.: *See—*
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Michel, Edmond: *See—*
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Michelbach, Alfons. Device for conveying or transferring eggs. 3,770,107, Cl. 198-157.000.
Michels, Alfred: *See—*
Kuhlow, Burkhard; Polte, Arnold; and Michels, Alfred, 3,770,670.
Michigan Technological University, Board of Control of: *See—*
Goksel, Mehmet Adnan, 3,770,416.
Midland-Ross Corporation: *See—*
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Midland-Ross of Canada Limited: *See—*
Cline, Alvis E., 3,770,579.
Spurrell, William Gordon, 3,770,578.
Mihara, Kazuyasu, to Sumitomo Chemical Company, Limited and Tokico Ltd. Method and apparatus for diluting and mixing chemical solution for agriculture. 3,770,198, Cl. 239-10.000.
Mikami, Bunji; and Kawamura, Mitsuaki, to Mitsui Shipbuilding and Engineering Co., Ltd. Method of burning liquid fuel in fluid bed apparatus. 3,770,369, Cl. 432-15.000.
Mikhailov, Mikhail Vasilievich Poplavko: *See—*
Belenky, Alexandr Mikhailovich; Lazko, Viktor Evgenievich; Toschev, Mikhailovich; Bikmametov, Ilgiz Ganeevich; Vilkov, Vladimir Kirillovich; Mosendz, Nikolai Alexandrovich; Yakushina, Galina Mikhailovna; and Mikhailov, Mikhail Vasilievich Poplavko, 3,770,45.
Milbourne, Charles C.: *See—*
Wais, Lowell; and Milbourne, Charles C., 3,769,939.
Miles Laboratories, Inc.: *See—*
Buckler, Robert Thomas; and Hartzler, Harold Eugene, 3,770,821.
Milkowski, John D.; Veber, Daniel F.; and Hirschmann, Ralph F., to Merck & Co., Inc. S-lower alkanoyl- and acetonyl-antimethyl cysteine. 3,770,822, Cl. 260-534.00s.
Millar, John M.; and Moran, William F., to Beatrice Foods Co. Electrostatic coating method of applying multilayer coating. 3,770,482, Cl. 117-17.000.
Miller, Christopher F., to Beckman Instruments, Inc. Light-emitting diode display. 3,771,015, Cl. 315-169.00r.
Miller, Donald B., to Electroprint, Inc. Colored polymeric microsphere toners. 3,770,692, Cl. 260-41.00c.
Miller, Edward P.: *See—*
Kolker, William A., 3,770,133.
Miller, Everett L.: *See—*
Tolf, Ingvar L.; Herzing, Vernon J.; Miller, Everett L.; and Lightfoot, George L., 3,770,141.
Miller, Frederic L.: *See—*
Brown, Charles H.; and Miller, Frederic L., 3,770,353.
Miller, Herman, Research Corporation: *See—*
Propst, Robert L.; and Propst, Howard B., 3,770,182.
Miller, James F.: *See—*
Haas, Charles B.; Taylor, Richard E.; Crockett, David E.; Miller, James F.; Paul, Howard R.; and Reid, Charles J., 3,769,876.
Miller, John Paul: *See—*
Brockins, Richard R.; and Miller, John Paul, 3,770,130.
Miller, Joseph A.; Kruglinski, Frank A.; and Freakes, Anthony, to General Corrugated Machinery Co., Inc. Case sealer. 3,769,777, Cl. 53-76.000.
Miller, Leslie T., to Speedriver Tool Corporation. Wire nut tool. 3,769,862, Cl. 81-90.00d.
Miller, Richard, to Victor Equipment Company. Sensitive check valve. 3,770,009, Cl. 137-543.190.
Miller, Roger A.: *See—*
Colburn, Steven C.; McPherson, Charles Q.; and Miller, Roger A., 3,770,335.
Mills, Harold E.; and Caesar, Michael B., to Occidental Petroleum Corporation. Production of potassium polyphosphates from phosphate acid sludges. 3,770,410, Cl. 71-1.000.
Minakawa, Kazuo: *See—*
Yamamoto, Jiro; Minakawa, Kazuo; Nishikado, Hideki; and Imon, Shintaro, 3,770,628.
Mine Safety Appliances Company: *See—*
Fertig, Glenn Howard, 3,770,974.
Minnesota Mining and Manufacturing Company: *See—*
Atendido, Jorge B.; and Hansen, Robert L., 3,770,635.
Elton, Robert L., 3,770,537.
Knoepfel, Hanspeter; and Silver, Spencer F., 3,770,708.
Meyer, Leo A.; and Perkins, Robert J., 3,770,442.
Minshull, John F.; and Murphy, Alan S., to International Business Machines Corporation. Digital data storage system. 3,771,142, Cl. 340-172.500.
Mirjanic, Milorad, to Daimler-Benz Aktiengesellschaft. Cylinder housing with dry cylinder liners. 3,769,880, Cl. 92-169.000.
Mitchell, Wallace F., to Ammco Tools, Inc. Spacer assembly. 3,769,692, Cl. 29-559.000.
Mito, Akio; Desaki, Masayasu; Koike, Kunio; and Kikui, Shunji, to Kabushikikaisha Tokyo Keiki. Acceleration and deceleration valve apparatus. 3,770,240, Cl. 251-15.000.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Kobayashi, Kyozo, 3,770,929.
Mitsui Shipbuilding and Engineering Co., Ltd.: *See—*
Mikami, Bunji; and Kawamura, Mitsuaki, 3,770,369.
Miura, Kozo: *See—*
Kawaguchi, Suezi; Miura, Kozo; Esaki, Shigenobu; and Hirase, Takahiro, 3,771,159.
Miyaji, Masayuki: *See—*
Sumikawa, Shozo; Mohri, Ikuji; and Miyaji, Masayuki, 3,770,807.
Miyamae, Toshiaki. Fishing line guide device. 3,769,737, Cl. 43-25.000.
Miyata, Katsuhiko: *See—*
Uno, Naoyuki; Nomura, Katsuhiko; Sakazaki, Tadazumi; Watanabe, Koichiro; Miyata, Katsuhiko; and Urano, Fumio, 3,769,886.
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Miyazaki, Yuji: *See—*
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Mizoguti, Takesi: *See—*
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Mizuno, Akinori: *See*—
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Billet, James; and Gough, Stanely T. D., 3,770,756.
Graven, Richard G., 3,770,614.
Heiba, El-Ahmadi I., 3,770,397.
Heiba, El-Ahmadi Ibrahim, 3,770,643.
Meyers, Clyde C., Jr., 3,770,841.
Rollmann, Louis Deane; and Srinivasan, Sundaresa, 3,770,781.
Schwab, Frederick C., 3,770,712.
Sexton, James H.; Slover, Vasel R., Jr.; Patton, Bobbie J.; and Gravley, Wilton, 3,770,006.
Mochizuki, Mitsuo. Collapsible door-fitting frame. 3,769,773, Cl. 52-626.000.
Mohri, Ikuji: *See*—
Sumikawa, Shozo; Mohri, Ikuji; and Miyaji, Masayuki, 3,770,807.
Molins Limited: *See*—
Labbe, Francis Auguste Maurice; Preston, Edward George; and Marritt, Clifford Russell, 3,769,989.
Molson Industries, Limited: *See*—
Dadic, Miroslav; Van Gheluwe, Joris E. A.; and Valyi, Zoltan, 3,770,453.
Van Gheluwe, Joris E. A.; and Dadic, Miroslav, 3,770,455.
Monsanto Company: *See*—
Boustany, Kamel; D'Amico, John Joseph; and Sullivan, Alfred Bay, 3,770,707.
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Dobinson, Frank, 3,770,704.
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Garabedian, Taniel A., 3,770,835.
Kerwood, Joseph Edward, 3,770,758.
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Moore, Alvin G., to Hercules Incorporated. Instrument for electrically measuring pressure changes. 3,769,827, Cl. 73-398.00r.
Moore, Ralph Bishop: *See*—
Lores, Carlos; and Moore, Ralph Bishop, 3,770,423.
Moore, Robert B. Amusement and exercise device. 3,770,275, Cl. 273-106.00r.
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Moran, William F.: *See*—
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Morgenroth, Henri. Heat deflector shield for fuel metering device or the like. 3,769,954, Cl. 123-198.00e.
Mori, Minno Kazuo: *See*—
Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Horohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isamu; Mori, Minno Kazuo; and Kobayashi, Tsoyoshi, 3,770,767.
Morishita, Kosaku: *See*—
Matsumoto, Akio; Tonogai, Seinosuke; and Morishita, Kosaku, 3,771,106.
Morlec, Emile, to International Business Machines Corporation. Audio multifrequency signal receiver. 3,770,900, Cl. 179-84.0vf.
Morris, Arthur Leslie; Colclough, Terence; and Brookes, Ronald, to Esso Research and Engineering Company. Process for preparing phosphorothinyl disulphides. 3,770,854, Cl. 260-985.000.
Morris, John A., III: *See*—
Hennessy, Leo B.; and Morris, John A., III, 3,770,662.
Morris, Philip, Incorporated: *See*—
Comes, Roger A., 3,770,836.
Morrison, John R. Method of making decorative articles. 3,770,535, Cl. 156-63.000.
Morrow, William B., to Aqua-West, Incorporated. Receptacle type humidifier for air conveying ducts and the like. 3,770,254, Cl. 261-105.000.
Morse Boulger, Inc.: *See*—
Grey, Jerry; and Zanft, Auram B., 3,770,385.
Morse, Donald B.; and Pribish, Bernard A., to Kemlite Corporation. Machine for trimming the edges of panels. 3,769,864, Cl. 83-79.000.
Morton-Norwich Products, Inc.: *See*—
Burch, Homer Albert, 3,770,740.
Mosendz, Nikolai Alexandrovich: *See*—
Belenky, Alexandr Mikhailovich; Lazko, Viktor Evgenievich; Toschev, Mikhailovich; Bikmametov, Ilgiz Ganeevich; Vilkov, Vladimir Kirillovich; Mosendz, Nikolai Alexandrovich; Yakushina, Galina Mikhailovna; and Mikhailov, Mikhail Vasilievich Poplavko, 3,770,45.
Moses, Adrian J., to Lear Siegler, Inc. Mode selection network. 3,771,130, Cl. 340-147.01p.
Mosier, John S.: *See*—
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Mosle, Ernst: *See*—
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Motorola, Inc.: *See*—
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Crowe, William J.; Ritchie, Kim; and Gurev, Harold S., 3,770,499.
Dattilo, Donald J., 3,770,177.
Race, Richard T., 3,769,926.
Mraz, Joseph, to Mraz Research Center, Ltd. Method and apparatus for grading shrimp. 3,770,123, Cl. 209-107.000.
Mraz Research Center, Ltd.: *See*—
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Biewer, Mathias L., 3,771,132.
Platt, John D., 3,770,091.
Muehl, Herman D. Tank vent and product valve system. 3,770,011, Cl. 137-587.000.
Mueller, Gunter H., to Ethyl Corporation of Canada Limited. Mixing nozzle. 3,770,208, Cl. 239-417.300.
Mueller, Irene Elma. Cookie game. 3,770,278, Cl. 273-153.00r.
Muench, Lloyd D., to Sherwood Medical Industries Inc. Pacing catheter with frictional fit lead attachment. 3,769,984, Cl. 128-404.000.
Muller, Fritz; Queck, Robert; Koch, Josef; Kowalski, Werner; Nolden, Werner; Selbsi, Gunter; and During, Helmut, to Knapsack Aktiengesellschaft. Spray nozzle for a spray dryer. 3,770,207, Cl. 239-397.500.
Muller, Johannes, to Handtmann, Albert, Metallgusswerk, Armaturen- und Fleischereimaschinenfabrik, Firma. Hydraulically operating sausage-filling and turn-off machine. 3,769,657, Cl. 17-35.000.
Murdock Inc.: *See*—
Murdock, Joseph Kelso; and Riddle, Eugene J., 3,770,000.
Uroshevich, Miroslav, 3,770,003.
Murdock, Joseph Kelso; and Riddle, Eugene J., to Murdock Inc. Sanitary frostproof hydrant. 3,770,000, Cl. 137-217.000.
Murdock, Robert H., to Rebco West, Inc. Interlocking frame construction. 3,770,245, Cl. 256-24.000.
Murphy, Alan S.: *See*—
Minshull, John F.; and Murphy, Alan S., 3,771,142.
Murphy, Vincent H., to Dempco, Inc. Lock for trailer hitch coupler. 3,770,299, Cl. 280-507.000.
Murray, Stephen F.; and Simmons, Harold T., to Mallory, P. R., & Co. Inc. Bussing block. 3,771,102, Cl. 339-19.000.
Musschoot, Albert, to General Kinematics Corporation. Vibratory conveyor with sound deadening means. 3,770,097, Cl. 198-220.0ba.
Myers, Stanley L.: *See*—
Beach, Robert C.; and Myers, Stanley L., 3,771,168.
Naber, Jaap E.: *See*—
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Nadeau, Richard G.: *See*—
Carter, Elbert P.; Johnson, Donald R.; McErlane, James E.; Nadeau, Richard G.; and Nieuweboer, Gerrit, 3,770,382.
Naegeli, Werner, to Pavena AG. Working process for an impregnation liquid for continuous treatment of a textile fiber band. 3,770,375, Cl. 8-149.100.
Naegeli, Werner, to Pavena AG. Method of producing a stable band consisting of adhesively bonded staple fibers of high lengthwise stability. 3,770,538, Cl. 156-85.000.
Nagahori, Tetuo; and Kanda, Kaoru, to Fujitsu Limited. Error correcting system of a magnetic tape unit. 3,771,125, Cl. 340-146.10f.
Nagame, Hiroshi: *See*—
Kinoshita, Koichi; Uehara, Shiro; Nagame, Hiroshi; and Yamada, Kazukiyo, 3,770,429.
Nagasaki, Osamu: *See*—
Katagiri, Yoshio; Miyata, Yoshio; and Nagasaki, Osamu, 3,770,654.
Nakabayashi, Takashi, to Yuasa Battery Company, Limited. Sodium-sulfur storage battery. 3,770,502, Cl. 136-6.0fs.
Nakamura, Shinichi: *See*—
Matsumoto, Jon-Ichi; Sekine, Yutaka; Takase, Yoshiyuki; and Nakamura, Shinichi, 3,770,742.
Nakanishi, Michio; De, Takanori; and Tashiro, Chiaka, to Yoshitomi Pharmaceutical Industries, Ltd. N-substituted piperidine compounds. 3,770,729, Cl. 260-240.0tc.
Nakanishi, Sadayuki, to Kobe Steel, Ltd. Reversing heat exchanger unit. 3,770,050, Cl. 165-97.000.
Nakao, Masaru: *See*—
Yanamoto, Hisao; and Nakao, Masaru, 3,770,752.
Namenyi, Istvan: *See*—
Gams, Erwin; Namenyi, Istvan; Wahlig, Helmut; Erdmann, Dietrich; and Koch, Wolfgang, 3,770,817.
Naramura, Isuyoshi: *See*—
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Narukawa, Osamu: *See*—
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National Cash Register Company, The: *See*—
Aneshansley, Nicholas E., 3,771,148.
Bishop, John J., 3,770,478.
National Distillers and Chemical Corporation: *See*—
Hager, Jerome E.; and Eisenhauer, John L., 3,770,852.
National Starch and Chemical Corporation: *See*—
Jarowenko, Wadym, 3,770,472.

Nelsen, Thomas Sloan. Voice controlled target release system. 3,770,981, Cl. 307-154.000.

Nelson, Carl S., Jr., to Opsonar Organ Corporation, mesne. Electronic musical instrument keying assembly providing a minimum of electrical noise. 3,769,869, Cl. 84-1.010.

Nelson, James Thomas: *See—*
Boll, Harry Joseph; Heightley, John Donnell; Koo, James Teh-Zen; Lynch, William Thomas; Nelson, James Thomas; Bard, Richard; Waaben, Sigurd Gunther; and Waggener, Herbert Atkin, 3,771,147.

Nelson, Norman A., to Texas Iron Works, Inc. Gate valve having pressure balanced stem. 3,770,247, Cl. 251-282.000.

Nelson, Norman C., to Kel-Lite Industries, Inc. Ammunition loader for revolvers. 3,769,733, Cl. 42-89.000.

Nelson, Terrance D.; and Hannula, Raymond H., to Allen-Bradley Company. Switch mounting structure. 3,770,925, Cl. 200-168.00c.

Nephew, Oliver T.: *See—*
Chalupsky, Paul A.; and Nephew, Oliver T., 3,770,138.

Neradka, Vincent F.: *See—*
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Neurodyne-Dempsey, Inc.: *See—*
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New England Nuclear Corporation: *See—*
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New Nippon Electric Company Ltd.: *See—*
Matsumoto, Akio; Tonogai, Seinosuke; and Morishita, Kosaku, 3,771,106.

New York University: *See—*
Youdin, Myron; Barker, June N.; and Reich, Theobald, 3,769,966.

Newell, Carl W. Battery terminal cleaner and shaper. 3,769,650, Cl. 15-105.000.

Newlin, John C.: *See—*
Marsh, Douglas D.; and Newlin, John C., 3,770,236.

Newman, Nicholas S., to Kendall Company, The, mesne. Composite nonwoven fabrics. 3,770,562, Cl. 161-156.000.

Newstead, Charles; and Wright, Andrew Charles Walden, to Girling Limited. Automatic adjusters. 3,770,083, Cl. 188-79.5gc.

Nezik, Jack A. Therapeutic device. 3,769,969, Cl. 128-68.000.

Nicholson, James J.: *See—*
Scarnato, Thomas J.; Dryan, James J.; Nicholson, James J.; and Falanga, Anthony J., 3,770,064.

Nickl, Franklyn George: *See—*
Schanne, Joseph Francis; and Nickl, Franklyn George, 3,770,944.

Nicolet Industries, Inc.: *See—*
Breiner, Richard C., 3,770,569.

Nicolet Paper Company: *See—*
Kallmes, Otto J.; and Saddler, Richard L., 3,770,580.

Niederjohn, Wayne M., to General Electric Company. Battery protective circuit for emergency lighting systems. 3,771,012, Cl. 315-86.000.

Nielsen, Donald R., to PPG Industries, Inc. Diperisophthalic acid compositions. 3,770,816, Cl. 260-502.00r.

Niemuth, Lewis C. Dolly for TV set or stereo or the like. 3,770,152, Cl. 214-384.000.

Nienburg, Hans Juergen; Eisfeld, Wolfgang; and Astheimer, Hans Joachim, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Simultaneous recovery of terephthalic acid and dimethyl terephthalate from crude terephthalic acid. 3,770,804, Cl. 260-475.00r.

Nieuweboer, Gerrit: *See—*
Carter, Elbert P.; Johnson, Donald R.; McErlane, James E.; Nadeau, Richard G.; and Nieuweboer, Gerrit, 3,770,382.

Niggemann, Richard E., to Sundstrand Corporation. Rankine cycle engine. 3,769,789, Cl. 60-36.000.

Nihon Rika Seishi Kabushiki Kaisha: *See—*
Yoshizawa, Atsushi; and Kitazawa, Takaji, 3,770,672.

Nika, John W.: *See—*
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Nikolsky, Viktor Alexandrovich: *See—*
Pavlov, Jury Vasilievich; Petrov, Alexandr Aleseevich; Nikolsky, Viktor Alexandrovich; Chunyaeva, Raisa Ivanovna; and Filin, Leonid Alexandrovich, 3,769,820.

Nilsen Mfg. Co.: *See—*
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Nimoy, Melvin; and Winnie, Alon P., to Johnson & Johnson. Slit sleeve for preventing displacement in a catheter assembly. 3,769,975, Cl. 128-214.400.

Nippon Air Brake Co., Ltd., The: *See—*
Oshida, Yasunosuke; Okamoto, Seisho; and Shinomiya, Eiichi, 3,770,329.

Nippon Electric Company Limited: *See—*
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Nippon Kogaku K.K.: *See—*
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Nippon Oil Company, Limited: *See—*
Araki, Yoshihiko; Sato, Hisatake; and Takahashi, Mikio, 3,770,674.
Yamamoto, Jiro; Minakawa, Kazuo; Nishikado, Hideki; and Imon, Shintaro, 3,770,628.

Nippon Zeon Co., Ltd.: *See—*
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Nishikado, Hideki: *See—*
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Nishimatsu Construction Company Limited: *See—*
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Nissan Denshi Kabushiki Kaisha: *See—*
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Nissan Motor Company, Limited: *See—*
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Nittel, Fritz: *See—*
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Pelz, Willibald; Credner, Hans-Heinrich; Schulte, Walter; Klein, Alfons; Wedemeyer, Karlfried; and Nittel, Fritz, 3,770,445.

NL Industries, Inc.: *See—*
Backus, Harold A., 3,770,964.

Nobusawa, Tsukumo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Electrical shutter-control systems for cameras. 3,769,887, Cl. 95-10.00t.

Nocek, Stanley J., to Bendix Corporation, The. Gear drive for a gyro controlled attitude indicator. 3,769,845, Cl. 74-5.00r.

Noda, Hiroshi, to Sanwa Tetsuki Kougiyou Kabushiki Kaisha. Method of clamping steel core aluminum stranded wires. 3,769,685, Cl. 29-459.000.

Noe, Sergio: *See—*
Gordini, Silvano; and Noe, Sergio, 3,770,252.

Noirot, Marcel L., to Societe des Verreries Industrielles Reunies du Loing. Distillator column. 3,770,592, Cl. 202-236.000.

Nolan, John J.; Marston, Peter G.; and Lontai, Laszlo N., to Magnetic Engineering Associates, Inc. Multiple matrix magnetic separation device and method. 3,770,629, Cl. 210-42.000.

Nolden, Werner: *See—*
Muller, Fritz; Queck, Robert; Koch, Josef; Kowalski, Werner; Nolden, Werner; Selbsi, Gunter; and During, Helmut, 3,770,207.

Nolin, Richard: *See—*
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Nolting, Karl-Heinz: *See—*
Levacher, Friedrich; Dornseifer, Karl; Nolting, Karl-Heinz; Frielingsdorf, Helmut; and Kirch, Hans-Joachim, 3,771,069.

Nomura, Katsuhiko: *See—*
Uno, Naoyuki; Nomura, Katsuhiko; Sakazaki, Tadazumi; Watanabe, Koichiro; Miyata, Katsuhiko; and Urano, Fumio, 3,769,886.

Nopanen, Esko J., to General Electric Company. Hair dryer with release mechanism. 3,769,718, Cl. 34-99.000.

Nora International Company, mesne: *See—*
Chisholm, Raymond S., 3,770,613.

Nordqvist, Jack. Apparatus for forming a foil envelop around a number of bodies assembled into a unit. 3,769,778, Cl. 53-182.000.

Nordsiek, Karl-Heinz: *See—*
Berg, Gerhard; and Nordsiek, Karl-Heinz, 3,770,694.

Norgaard, Ronald Jack. Plow blade hoist with under-truck mount. 3,769,724, Cl. 37-41.000.

Norman, Melvin H.: *See—*
Holbrook, Edward L.; Gripe, William B.; and Norman, Melvin H., 3,769,996.

Norman, Patrick S. External can seam checking apparatus. 3,769,713, Cl. 33-174.001.

Norman, Richard R., to Bressickello, Tony J. Interlinked packaging bags. 3,770,188, Cl. 229-53.000.

Northern Electric Company, Limited: *See—*
Davis, Kan Bryan; and Zuber, Bretislav Paul, 3,769,677.

Norton Company: *See—*
Gladstone, Matthew T.; and Malloy, John F., 3,770,555.

Norton, Richard V., to Sun Research and Development Co. Stabilization of beta-aminopropionitriles. 3,770,798, Cl. 260-465.50r.

Norton, Richard V., to Sun Research and Development Co. Terephthalonitrile purification process. 3,770,800, Cl. 260-465.00c.

Norton, Richard V., to Sun Research and Development Co. Preparation of monoammonium isophthalate. 3,770,818, Cl. 260-515.00p.

Norton, Richard V., to Sun Research and Development Co. Process for monoammonium terephthalate and terephthalic acid. 3,770,819, Cl. 260-515.00p.

Noshay, Allen: *See—*
Matzner, Markus; McGrath, James E.; and Noshay, Allen, 3,770,849.

Nott, William H.: *See—*
Dietrich, Arnold K.; and Nott, William H., 3,771,011.

Novitch, Howard, to New England Nuclear Corporation. Dually sealable, non-leaking vial for shipping radioactive materials. 3,770,155, Cl. 215-37.00r.

Novopress GmbH: *See—*
Dishcler, Helmut, 3,769,905.

Nutter, Dale E. Valve trays having means for avoiding edge erosion. 3,770,255, Cl. 261-114.0vt.

N.V. Werkspoor-Amsterdam: *See—*
De Vos, Ferdinand Allard; and Ter Steege, Jan Hendrik, 3,770,888.

Nycz, Edward: *See—*
Paszek, Wladyslaw; Drysz, Piotr; Nycz, Edward; and Wycisk, Walenty, 3,771,052.

Nydam, Frank, to Columbia Products Company. Heat sealed thread winding as for fishing rods. 3,769,736, Cl. 43-24.000.

Nyquist, Richard A.; and Reder, Thomas L., to Dow Chemical Company, The. Carbanilic acid: O-fluoro-, allyl ester. 3,770,695, Cl. 260-471.00c.

Nystrand, Ernst Daniel; and Drufger, Archie S., to Paper Converting Machine Company. One-at-a-time alternate dispensing method. 3,770,172, Cl. 225-2.000.

Nystrom, James C. Fire door lock assembly. 3,770,306, Cl. 292-169.000.
Oakden, Julia: *See—*
Florens, Nicholas, Jr., 3,769,634.
Oakden, Tina M., mesne: *See—*
Florens, Nicholas, Jr., 3,769,634.
Oberle, Georges: *See—*
Edme, Georges; Fichot, Robert; and Oberle, Georges, 3,769,851.
Obermaier, Alfred A.; and Piperman, Martin J., to Alnor Instrument Company, div. of Illinois Testing Laboratories, Inc. Air velocity measuring system. 3,769,835, Cl. 73-202.000.
Oblonsky, Jan Gustav: *See—*
Barner, Robert Paul; Deveer, John Anton; and Oblonsky, Jan Gustav, 3,771,137.
Occidental Petroleum Corporation: *See—*
Mills, Harold E.; and Caesar, Michael B., 3,770,410.
O'Connor, James J.: *See—*
Lademann, Ernest E.; and O'Connor, James J., 3,769,698.
O'Connor, Joseph, Jr., to Dieley & Mueller, Inc. Aerodynamically and hydrodynamically stable torqued butterfly valve and vane. 3,770,242, Cl. 251-305.000.
Oetiker, Hans. Structural assemblies. 3,769,772, Cl. 52-646.000.
O'Farrell, Charles P.: *See—*
Hubbard, Addison W.; Powers, Kenneth W.; and O'Farrell, Charles P., 3,770,682.
Ogle, John S.: *See—*
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O'Hara, Martin J.: *See—*
Sheets, Herbert D., Jr.; Meyer, Ronald A.; and O'Hara, Martin J., 3,770,401.
Ohio Brass Company, The: *See—*
Smith, Edward P., 3,771,020.
Ohki, Kusuo: *See—*
Kominami, Naoya; Iwaisako, Toshiyuki; and Ohki, Kusuo, 3,770,616.
Ohsima, Susumu, to Toyoda Koki Kabushiki Kaisha. Chucking apparatus for a machine tool. 3,769,761, Cl. 51-237.0cx.
Ohta, Minoru: *See—*
Hayashi, Yasuo; Kodama, Kenji; Ohta, Minoru; and Saito, Shigeru, 3,770,386.
Ohta, Wasaburo: *See—*
Kasuya, Kazuhiko; Ohta, Wasaburo; and Okuno, Zenjiro, 3,770,485.
Oishi, Masaaki; Takahashi, Yoshinaga; and Yoshizawa, Keiichi, to Kabushiki Kaisha Hattori Tokeiten. Printing device for selectively printing different groups of figures. 3,769,907, Cl. 101-93.00c.
Oishi, Yoshihiro: *See—*
Awano, Taikichi; and Oishi, Yoshihiro, 3,769,696.
Okada, Shiro, to Fuji Jyukogyo Kabushiki Kaisha. Resilient torque bar. 3,769,813, Cl. 64-2.00r.
Okada, Takashi: *See—*
Okazaki, Takeo; Sakakibara, Naotaka; and Okada, Takashi, 3,770,639.
Okagami, Akio: *See—*
Ozaki, Atsumu; Aika, Ken-Ichi; Furuta, Akio; and Okagami, Akio, 3,770,658.
Okamoto, Seisho: *See—*
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Okamoto, Tadashi: *See—*
Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Horohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isamu; Mori, Minno Kazuo; and Kobayashi, Tsoyoshi, 3,770,767.
Okamura, Yasuhiro: *See—*
Sakata, Kaoru; Asada, Yosiharu; and Okamura, Yasuhiro, 3,770,866.
Okazaki, Takeo; Sakakibara, Naotaka; and Okada, Takashi, to Nippon Electric Company Limited. Hexagonal ferrites. 3,770,639, Cl. 252-62.570.
Okudaira, Mitsu: *See—*
Tomita, Chuji; Miyazaki, Yuji; Kobayashi, Kazuo; and Okudaira, Mitsu, 3,770,955.
Okuno, Zenjiro: *See—*
Kasuya, Kazuhiko; Ohta, Wasaburo; and Okuno, Zenjiro, 3,770,485.
Okuno, Zenjiro; Mizuno, Akinori; and Kondoh, Ikuyo, to Kabushiki Kaisha Ricoh. Liquid developer for developing electrostatic latent image. 3,770,637, Cl. 252-62.100.
Olah, Emmerich I., to Interlake, Inc. Strip edge conditioner. 3,770,178, Cl. 226-198.000.
Olin Corporation: *See—*
Barnabe, Charles E., 3,770,611.
Dore, James E.; and Stauffer, William O., 3,770,046.
Pryor, Michael J.; Crane, Jacob; and Winter, Joseph, 3,770,396.
Oliver, Gene L., to Eastman Kodak Company. Dyes and photographic materials. 3,770,757, Cl. 260-304.000.
Olivetti, Ing., C., & C., S.p.A.: *See—*
Gechele, Walter; and Pasini, Arnaldo, 3,770,941.
Guerrini, Gian Paolo; and Falconieri, Remo, 3,770,095.
Olivier, Gabriel. Tethered ball propelling apparatus, targets, and scoring markers. 3,770,272, Cl. 273-97.00r.
Olson, Eugene T. Routing fixture. 3,770,031, Cl. 144-136.00r.
Olympus Optical Company: *See—*
Itoh, Keiichi, 3,770,341.
Onarheim, Thor; and Solbert, Per, to Stord Bartz Industri A/S. Processing of animal material compositions. 3,769,900, Cl. 99-348.000.
O'Neal, Wilbert O., to Vendo Company, The. Product displaying, selective, dispensing apparatus. 3,770,105, Cl. 198-138.000.
O'Neill, Robert W.: *See—*
Belady, Laszlo A.; De Orazio, William R.; and O'Neill, Robert W., 3,771,144.
Ono, Hisatake: *See—*
Osada, Chiaki; Satomura, Masato; and Ono, Hisatake, 3,770,443.
Watarai, Syu; and Ono, Hisatake, 3,770,428.
Ono, Taiichi. Stool of elastic sheet material. 3,770,319, Cl. 297-461.000.
Opsonar Organ Corporation, mesne: *See—*
Nelson, Carl S., Jr., 3,769,869.
Opti-Holding AG: *See—*
Heimberger, Helmut, 3,770,361.
Optical Coating Laboratory, Inc.: *See—*
Anthon, Erik W., 3,770,355.
Orbison, Frank H.; and Helland, Howard M., to Appleton Mills. Single endless strand mounted in a series of parallel convolutions fibrous web supporting surface in a papermaking machine. 3,770,581, Cl. 162-348.000.
Ordway, Donald E.; and Hale, Richard W., to United States of America, Navy. Bubble generator. 3,769,833, Cl. 73-147.000.
Organic Laboratories, Inc.: *See—*
Chambers, James C.; and Kimbro, William S. (said Kimbro assor. to), 3,770,411.
Orlowski, Jan Alexander: *See—*
Lee, Henry L., Jr.; Stoffey, Donald G.; Stang, Albert F.; and Orlowski, Jan Alexander, 3,770,811.
Ormesher, Robert J.: *See—*
Spear, Robert E.; Ormesher, Robert J.; and Short, Herbert M., 3,770,420.
Orth, Harold R.; Biskis, Kestutis; and Yeh, Rudolph E., to International Harvester Company. Dual direction flow control valve. 3,770,007, Cl. 137-501.000.
Ortho Pharmaceutical Corporation: *See—*
Hirsch, Allen F., 3,770,780.
Osada, Chiaki; Satomura, Masato; and Ono, Hisatake, to Fuji Photo Film Co., Ltd. Photosensitive composition comprising a photosensitive. 3,770,443, Cl. 96-86.00p.
Osak, Andrew; and Dunst, Franz Alois. Movable target describing an oval path. 3,770,274, Cl. 273-105.200.
Osawa, Misumi: *See—*
Kito, Ryoichiro; Maeda, Kazuo; Osawa, Misumi; Hayasaka, Nobuo; Watanabe, Hisatsugu; and Akaike, Takenori, 3,770,147.
Oshida, Yasunosuke; Okamoto, Seisho; and Shinomiya, Eiichi, to Nippon Air Brake Co., Ltd., The. Brake control apparatus. 3,770,329, Cl. 303-22.00r.
Oswitch, Stanley; and Kipp, Kevin K., to Ferro Corporation. Prefabricated gel coats. 3,770,690, Cl. 260-37.0ep.
Ottenheym, Adrian: *See—*
Wuhrer, Josef; Kurczyk, Heinz Georg; and Ottenheym, Adrian, 3,770,475.
Owego Heat Treat, Inc.: *See—*
Engelhard, William E., 3,770,194.
Owens-Corning Fiberglass Corporation: *See—*
McFarling, James L., 3,770,671.
Owens-Illinois, Inc.: *See—*
Amberg, Stephen W.; Amberg, Ralph G.; and Ludder, Rodney E., 3,770,860.
Ansevin, Ronald W.; Avetta, Edward D.; and McKay, William P., 3,770,969.
Colchagoff, Robert D., 3,770,409.
Di Frank, Frank J.; and Greiwe, Daniel L., 3,770,144.
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Oxy Metal Finishing Corporation: *See—*
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Creutz, Hans-Gerhard, 3,770,598.
Martin, Sylvia, 3,770,599.
Oxy Metal Finishing Corporation, mesne: *See—*
Brown, Henry, 3,770,730.
Ozaki, Akikazu. Portable heater-cooker. 3,769,957, Cl. 126-9.00a.
Ozaki, Atsumu; Aika, Ken-Ichi; Furuta, Akio; and Okagami, Akio, to Japan Gasoline Co., Ltd. Ammonia synthesis catalyst. 3,770,658, Cl. 252-443.000.
Ozutsumi, Minoru; Arakawa, Kyokuji; Yamamoto, Masao; and Narukawa, Osamu, to Hodogaya Chemical Co., Ltd. 2,4-Disubstituted-5-imino-7,5-dihydro-1,2,4-triazolium-3-yl azo aniline or naphthylamine dyestuffs. 3,770,716, Cl. 260-146.00r.
Pachmayr, Frank A.; and Farrar, Jack R. Anti-fouling shot pattern control device. 3,769,731, Cl. 42-79.000.
Paesold, Gerold: *See—*
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Paganozzi, L. Rita: *See—*
Kim, Tai K.; Paganozzi, L. Rita; MacInnis, Martin B.; and Laferty, John M., 3,770,869.
Paget, Frederick W.; and Avallon, John C., Jr., to GTE Sylvania Incorporated. Constant wattage autotransformer ballast for high pressure sodium lamp. 3,771,068, Cl. 333-20.000.

Paget, Fredrick W., to GTE Sylvania Incorporated. Power supply for starting and operating arc lamps. 3,771,014, Cl. 315-136.000.

Palazzetti, Mario, to Fiat Societa per Azioni. Electronic control for vehicle suspension systems. 3,770,292, Cl. 280-124.00f.

Palfy, Robert Miklos, to Logging Development Corporation. Delimber. 3,770,030, Cl. 144-2.00z.

Palmer, Harold A.; and Herren, Cecil L., to Texaco Inc. Continuous attic flooding. 3,770,057, Cl. 166-306.000.

Paper Converting Machine Company: *See*—
Nystrand, Ernst Daniel; and Drufger, Archie S., 3,770,172.

Pappo, Raphael: *See*—
Collins, Paul W.; and Pappo, Raphael, 3,770,776.

Parera, Pedro Pere. Safety fastener means. 3,769,664, Cl. 24-217.000.

Parke, Davis & Company: *See*—
Butler, Donald E., 3,770,762.

Parker, Earl E., to PPG Industries, Inc. Method of making and coating with high solids cured acrylic syrups. 3,770,490, Cl. 117-93.310.

Parker, James W., to Chicken Unlimited, Inc. Heating tube and baffle for deep fat fryers. 3,769,959, Cl. 126-91.000.

Parker, John C.: *See*—
Prodger, Brian S.; Parker, John C.; Bosley, Denis V.; and Toy, Raymond M., 3,769,746.

Parkwood Laminates, Inc.: *See*—
Haigh, John M., 3,770,536.

Parsons, John Henry, to Fisons Limited. Certain 1,2,4-oxa- and -thiadiazol-5-yl thioalkanole acid derivatives. 3,770,754, Cl. 260-302.0sd.

Partridge, Harold De Vere, to Hooker Chemical Corporation. Activated chlorate. 3,770,646, Cl. 252-187.000.

Parups, Eriks; and Conti, Joseph A., to Pitney-Bowes, Inc. Demand feed hold down means. 3,770,263, Cl. 270-58.000.

Pasero, Edoardo: *See*—
Carignani, Milvio; Conti, Michele; Berte, Dufour; Rossi, Geremia; Pasero, Edoardo; and Zmolnig, Hermann, 3,770,415.

Pasetti, Adolfo: *See*—
Bianesi, Dario; and Pasetti, Adolfo, 3,770,792.

Pasini, Arnaldo: *See*—
Gechele, Walter; and Pasini, Arnaldo, 3,770,941.

Paszek, Wladyslaw; Drysz, Piotr; Nycz, Edward; and Wycisk, Walenty. Method of measuring a rectified voltage and a rectification circuit therefor. 3,771,052, Cl. 324-119.999.

Patton, Bobbie J.: *See*—
Sexton, James H.; Slover, Vasel R., Jr.; Patton, Bobbie J.; and Gravley, Wilton, 3,770,006.

Paul, Henry N., III, to Thiokol Chemical Corporation. Polysulfide latex based caulking compositions exhibiting improved physical properties. 3,770,678, Cl. 260-28.000.

Paul, Howard R.: *See*—
Haas, Charles B.; Taylor, Richard E.; Crockett, David E.; Miller, James F.; Paul, Howard R.; and Reid, Charles J., 3,769,876.

Pavena AG: *See*—
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Naegeli, Werner, 3,770,538.

Pavlov, Jury Vasilievich; Petrov, Alexandr Aleseevich; Nikolsky, Viktor Alexandrovich; Chunyaeva, Raisa Ivanovna; and Filin, Leonid Alexandrovich; deceased (by Bulaeva, Svetlana Ivanovna; administrator). Pelt fleshing machine. 3,769,820, Cl. 69-46.000.

Peacock, Alton E.: *See*—
Self, Joseph A.; Sovereign, Gerald W.; and Peacock, Alton E., 3,769,669.

Peetoom, Frans: *See*—
Fekete, Lajos F.; and Peetoom, Frans, 3,770,631.

Peifer, Gary S.; Hughes, James L.; and Johnson, Virgil H., to Caterpillar Tractor Company. Foot pedal actuating mechanism. 3,769,852, Cl. 74-512.000.

Pelz, Willibald: *See*—
Boie, Immo; Schulte, Walter; Pelz, Willibald; Krimm, Heinrich; Freitag, Dieter; and Nittel, Fritz, 3,770,447.

Pelz, Willibald; Credner, Hans-Heinrich; Schulte, Walter; Klein, Alfons; Wedemeyer, Karlfried; and Nittel, Fritz, to Agfa-Gevaert Aktiengesellschaft. Silver halide color photographic material containing couplers substituted with dicyclopentyl phenoxy group. 3,770,445, Cl. 96-100.000.

Pelzholdt, J. S., Firma: *See*—
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Penn Engineering & Manufacturing Corporation: *See*—
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Pennwalt Corporation: *See*—
Mageli, Orville Leonard; and McKellin, Wilbur H., 3,770,770.

Pentelow, Tony: *See*—
Ivemy, Alan; Sherwen, Theo; and Pentelow, Tony, 3,770,202.

Pepper, Roger T.; and Kendall, Ernest G., to United States of America, Air Force. Metal impregnated graphite fibers and method of making same. 3,770,488, Cl. 117-47.00r.

Perkins, Robert J.: *See*—
Meyer, Leo A.; and Perkins, Robert J., 3,770,442.

Perl, Theodore. Flashlight attachment clip for spectacles. 3,769,663, Cl. 24-81.0ad.

Perry, Kenneth E. Workpiece finishing machine. 3,769,751, Cl. 51-2.00r.

Persidok, Jacek Antoni, to Ecos Electronics Corporation. Method and apparatus for measuring impedance in the presence of unwanted signals. 3,771,057, Cl. 324-57.00r.

Persson, Eric Sigfrid; and Persson-Melin, Signe Harriet, to Expo Nord AB. Sitting furniture. 3,770,317, Cl. 297-445.000.

Persson-Melin, Signe Harriet: *See*—
Persson, Eric Sigfrid; and Persson-Melin, Signe Harriet, 3,770,317.

Pesson, Marcel; and Techer, Henri, to Laboratories Roger Bellon. 3-Oxo-2,3-dihydro-1,4-benzoxazine derivatives. 3,770,734, Cl. 260-244.00r.

Pester, William B.: *See*—
Sloane, Thomas E., Jr.; Hart, William; and Pester, William B., 3,769,744.

Peter, Richard: *See*—
Angliker, Hans-Joerg; and Peter, Richard, 3,770,718.

Petersen, Svend Aage; and Genson, Samuel Richard, to Johns-Manville Corporation. Apparatus for processing wound strand from filament forming materials. 3,770,402, Cl. 65-11.00w.

Petersen, Walter Adrian, to International Nickel Company, Inc., The. Welding material. 3,770,427, Cl. 75-171.000.

Peterson, Evald O.: *See*—
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Petro, James: *See*—
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Petrolite Corporation: *See*—
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Redmore, Derek, 3,770,750.

Petrov, Alexandr Aleseevich: *See*—
Pavlov, Jury Vasilievich; Petrov, Alexandr Aleseevich; Nikolsky, Viktor Alexandrovich; Chunyaeva, Raisa Ivanovna; and Filin, Leonid Alexandrovich, 3,769,820.

Peyser, Leonard F.; and Leschanz, Karl, to Machlett Laboratories, Incorporated, The. Cassette direction detector. 3,770,975, Cl. 250-491.000.

Pfarrwaller, Erwin, to Sulzer Brothers Limited. Sley. 3,770,024, Cl. 139-188.000.

Pfeiffer, Albert: *See*—
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Pfizer, Inc.: *See*—
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Goldman, Irvino M., 3,770,741.
Hamsher, James F.; and Tate, Groton Bryce E., 3,770,587.

Pfoertner, Rolf. Elastomeric traction device. 3,770,039, Cl. 152-221.000.

Phelan, Harry R., to Harris-Intertype Corporation, mesne. Microstrip to microstrip transition. 3,771,075, Cl. 333-84.00m.

Philco-Ford Corporation: *See*—
White, Matthew B., 3,770,352.

Phillips, Floyd W. Trailer hitch anti-breakaway device. 3,770,298, Cl. 280-457.000.

Phillips, James P., to Andrew Corporation. Printed-circuit feed for reflector antennas. 3,771,161, Cl. 343-770.000.

Phillips Petroleum Company: *See*—
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Finney, Herschel D., 3,769,803.
Tabler, Donald C., 3,770,660.
Zelinski, Robert P.; Short, James N.; Gath, Rudolph H.; and Zuech, Ernest A., 3,770,713.

Phillips, Wendell Gary, to Monsanto Company. 3-Pyridyl-1,2,4-thiadiazole-5-monooxamides. 3,770,749, Cl. 260-294.80d.

Phillips, Wendell Gary, to Monsanto Company. Substituted alpha, alpha-dichloro-methane-sulfenyl chlorides and their manufacture. 3,770,824, Cl. 260-543.00h.

Phillips, William E. Cooker. 3,769,901, Cl. 99-444.000.

Phinney, Robert H. Golf putter. 3,770,279, Cl. 273-167.00g.

Photogenex, Inc.: *See*—
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Picard, Jean P.: *See*—
Bobinski, Jack; and Picard, Jean P., 3,770,563.

Piccione, Nicholas E., to Dossert Manufacturing Corporation. Fault indicator and locator for buried cables and zero sequence current sensing device. 3,771,049, Cl. 324-51.000.

Pieper, Rudolf: *See*—
Klein, Heinrich; Pieper, Rudolf; and Hoffmann, Alfred, 3,769,781.

Pieracci, Angiolo; and Giachetti, Alfredo, to Billi S.p.A. Device for automatic and programmed insertion of needles into work in rectilinear hosiery machines. 3,769,814, Cl. 66-76.00r.

Pierron, Claude Raymond, to Les Applications Industrielles Vosgiennes, SAPIVOG. Method of laying accessory parts onto the neck portion of garments. 3,769,635, Cl. 2-243.00r.

Pietrucci, Andre; Imbert, Pierre; Berthou, Jean; and Juston, Claude. Device for transforming strips of material into dimensioned pieces. 3,769,866, Cl. 83-302.000.

Pilkington Brothers, Limited: *See*—
Lawrenson, Jack, 3,770,407.
Robinson, Albert Sidney; Loukes, David Gordon; and Lawrenson, Jack, 3,770,406.

Pinard, Alward I.: *See*—
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Pinkerton, Lyle C. Inboard-outboard drive mechanism for boats. 3,769,930, Cl. 115-35.000.

Piotroshi, Peter N.: *See*—
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Piperman, Martin J.: *See*—
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Martin, Samuel W., 3,770,348.
Parups, Eriks; and Conti, Joseph A., 3,770,263.
Pitts, John O. Fishing lure. 3,769,739, Cl. 43-42.350.
Piwonka, Thomas S.: *See—*
Kirkpatrick, Milton E; Piwonka, Thomas S.; and Marcus, Bruce D., 3,770,047.
Plas-Steel Products, Inc.: *See—*
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Plasser, Franz; and Theurer, Josef. Mobile track survey apparatus for determining the track camber. 3,769,715, Cl. 33-338.000.
Platt, John D., to MSI Data Corporation. Wire type tape printing apparatus. 3,770,091, Cl. 197-1.00r.
Plessey Handel und Investments A.G.: *See—*
Cotton, John Michael; Williams, James Jeffrey Llewelyn; and Cosserat, David Cockburn, 3,771,146.
Ploch, Siegfried; Scholtis, Walter; Gerischer, Heini; Zschunee, Heinz; and Dietrich, Karl-Heinz, to Forschungsinstitut fur Textiltechnologie Karl-Marx-Stadt. Method of producing textiles on knitting machines. 3,769,815, Cl. 66-85.00a.
Ploch, Siegfried; Zeisberg, Peter; Gerischer, Heini; Hennig, Siegfried; Linack, Manfred; and Klinger, Kurt, to Forschungsinstitut fur Textiltechnologie Karl-Marx-Stadt. Corduroy and process for producing corduroy. 3,769,816, Cl. 66-193.000.
Plumeau, Charles A., to International Telephone and Telegraph Corporation. Reflective multiplier phototube. 3,771,004, Cl. 313-95.000.
Pogacar, Peter: *See—*
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Poheim, Walter: *See—*
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Polaroid Corporation: *See—*
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Douglas, Lawrence M., 3,769,893.
Lane, William Patrick, 3,769,892.
Taylor, Lloyd D., 3,770,439.
Poliak, John M., to Leviton Manufacturing Co., Inc. Rocker-type electrical switch. 3,770,920, Cl. 200-67.00a.
Pollart, Dale Flavian: *See—*
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Polte, Arnold: *See—*
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Poot, Albert Lucien; Heugebaert, Clement; Brinckman, Eric Maria; Von Konig, Anita; and Kampfer, Helmut, to Agfa-Gevaert Aktiengesellschaft. Lightsensitive photographic material. 3,770,448, Cl. 96-114.100.
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Porter, John P.; and Karper, Paul W., to Goodrich, B. F., Company, The. Viscurometer. 3,769,830, Cl. 73-15.600.
Portinari, Antonio: *See—*
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Positrol, Inc.: *See—*
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Post, Herman B., to Goodyear Tire & Rubber Company, The. Elastic cover and method of applying said cover. 3,770,876, Cl. 174-88.00r.
Poulsen, Peder Ulrik. Electric coil consisting of a continuous strip-shaped conductor. 3,771,086, Cl. 336-192.000.
Powers, Kenneth W.: *See—*
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Poyarkov, Oleg Petrovich: *See—*
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Parker, Earl E., 3,770,490.
Seiner, Jerome A., 3,770,604.
Pratt, Stanley L., to Beckman Instruments, Inc. Potentiometric cell with dual slope display meter calibration circuit. 3,770,609, Cl. 204-195.00m.
Presley, Rex W., to Bendix Corporation, The. Rotary actuator. 3,770,997, Cl. 310-82.000.
Preston, Edward George: *See—*
Labbe, Francis Auguste Maurice; Preston, Edward George; and Marritt, Clifford Russell, 3,769,989.
Prezewowsky, Klaus: *See—*
Hofmeister, Helmut; Laurent, Henry; Prezewowsky, Klaus; Wiechert, Rudolf; and Steinbeck, Hermann, 3,770,726.
Priaroggia, Paolo Gazzana; and Portinari, Antonio, to Industrie Pirelli Societa per Azioni Centro Pirelli. Method and apparatus for the continuous manufacture of a flexible waveguide. 3,769,697, Cl. 29-600.000.
Pribish, Bernard A.: *See—*
Morse, Donald B.; and Pribish, Bernard A., 3,769,864.
Price Brothers Company: *See—*
Keyser, Lewis R., 3,770,304.
Price, Richard Thompson, to Akzona Incorporated, mesne. Diagnostic test slide. 3,770,383, Cl. 23-253.0tp.
Price, Thomas C.; and Montgomery, Robert M., to Harris-Intertype Corporation. Static eliminator. 3,769,695, Cl. 29-592.000.
Prino, Giuseppe: *See—*
Butti, Adriano; Prino, Giuseppe; and Bertellini, Gianfranco, 3,770,720.
Pritulsky, James, to AMP Incorporated. Flag type electrical terminal. 3,771,111, Cl. 339-223.00r.
Proctor, Denver L.; and Proctor, Rudy R., to Jet-X Corporation. Sprayer with detergent or chemical additive feed. 3,770,205, Cl. 239-317.000.
Proctor, Rudy R.: *See—*
Proctor, Denver L.; and Proctor, Rudy R., 3,770,205.
Prodger, Brian S.; Parker, John C.; Bosley, Denis V.; and Toy, Raymond M., to Mattel, Inc. Rubber band drive for toy vehicle. 3,769,746, Cl. 46-206.000.
Profile Identification (Proprietary) Limited: *See—*
Clarke, Eric C.; and Lindsay, Iain Hardy, 3,769,709.
Propst, Howard B.: *See—*
Propst, Robert L.; and Propst, Howard B., 3,770,182.
Propst, Robert L.; and Propst, Howard B., to Miller, Herman, Research Corporation. Animal marking apparatus and method. 3,770,182, Cl. 227-146.000.
Prosser, Thomas J., to Hercules Incorporated. Nitrosation of phenols with nitrogen trioxide. 3,770,834, Cl. 260-621.00n.
Pryor, Clyde Rober: *See—*
Hollingshead, Robert A.; and Pryor, Clyde Rober, 3,771,023.
Pryor, Michael J.; Crane, Jacob; and Winter, Joseph, to Olin Corporation. Composite metal article. 3,770,396, Cl. 29-199.000.
Przybylinski, Phillip G.; and Raidt, Joe B., to Pullman Incorporated. High side sill railway hopper car. 3,769,918, Cl. 105-248.000.
Pullman Incorporated: *See—*
Przybylinski, Phillip G.; and Raidt, Joe B., 3,769,918.
Snyder, Richard C.; Drueger, Alan F.; and Steder, Henry E., 3,769,917.
Pulsation Corporation: *See—*
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Pungs, Wolfgang: *See—*
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Purdum, Glenn R., Jr.: *See—*
Jones, George R.; Dunn, James F.; and Purdum, Glenn R., Jr., 3,769,967.
Puzik, Otto V., to Willow Hill Industries Inc. Method of making tubular laminated article. 3,769,691, Cl. 29-523.000.
Quast, Gilbert W.; Poheim, Walter; and Schultz, Ernest J., to Rex Chainbelt Inc. Skimming mechanism for square tanks. 3,770,132, Cl. 210-525.000.
Queck, Robert: *See—*
Muller, Fritz; Queck, Robert; Koch, Josef; Kowalski, Werner; Nolden, Werner; Selbsi, Gunter; and During, Helmut, 3,770,207.
Quentin, Jean-Pierre, to Rhone-Poulenc S.A. Ion-exchange membranes. 3,770,666, Cl. 260-2.10e.
Quick, Robert G., to Hy-Rider, Inc. Travel home with car-top hitch. 3,770,297, Cl. 280-423.00r.
Quinlan, Patrick M., to Petrolite Corporation. Cyclic thiazines. 3,770,732, Cl. 260-243.00r.
Quinn, Peter T., to Honeywell Inc. Computer flash light sensing apparatus. 3,769,888, Cl. 95-10.0ce.
Race, Richard T., to Motorola, Inc. Marine galvanic control circuit. 3,769,926, Cl. 114-.50r.
Raddi, William J.; Kligerman, Jerome L.; and Herrmann, Cal C., to ESB Incorporated. Monitor apparatus for implanted pulse generator. 3,769,965, Cl. 128-2.05r.
Raefield, Robert W., to Systems Enterprises Inc. Washing machine. 3,770,010, Cl. 137-571.000.
Raidt, Joe B.: *See—*
Przybylinski, Phillip G.; and Raidt, Joe B., 3,769,918.
Rainer, Corrado. Chewing toothbrush. 3,769,652, Cl. 15-167.00a.
Rakowsky, Edward L., to Singer Company, The, mesne. Actuating mechanism. 3,769,875, Cl. 89-1.00b.
Ralles, James Allen. Method for forming water candles. 3,770,865, Cl. 264-279.000.
Ralls, R. G.: *See—*
Stroud, Lebern W.; and Everett, Jack E., 3,770,976.
Ramaswamy, Vellayan, to Bell Telephone Laboratories, Incorporated. Switch for fiber-optic transmission systems. 3,770,339, Cl. 350-160.00r.
Ramoska, John: *See—*
Jackson, Harry Y.; Walker, Charles G.; and Ramoska, John, 3,770,086.
Rampe, John F., to Rampe Research. Finishing machine including pressure responsive valve peripherally sealing tub drain openings. 3,769,759, Cl. 51-163.000.
Rampe Research: *See—*
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Randel, Mortimer A. Lock device for securing apertured members. 3,769,821, Cl. 70-33.000.
Randmer, Jacob A., to Machlett Laboratories, Incorporated. Electron beam heating apparatus. 3,770,934, Cl. 219-121.0eb.
Rapistan, Incorporated: *See—*
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Ray, Philip M.: *See—*

Fayling, Clarence D.; Van Horn, John W.; and Ray, Philip M., 3,770,090.
Raymond, Charles, to Redskin Engines Company. Rotary engine. 3,769,944, Cl. 123-8.350.
Raytheon Company: *See*—
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Hatcher, Burrell R., 3,771,158.
RCA Corporation: *See*—
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Griffin, Patrick Joseph, 3,769,908.
Kessler, Sebastian William, Jr.; and Keller, Robert Franklin, 3,769,688.
Law, Harold Bell, 3,770,434.
Martin, William Edward, 3,770,973.
Schanne, Joseph Francis; and Nicki, Franklyn George, 3,770,944.
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Rearick, Edward W., Jr.: *See*—
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RECORDATI SA Shemical and Pharmaceutical Company: *See*—
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Recordati Sa-Chemical and Pharmaceutical Company: *See*—
Sianesi, Enrico, 3,770,802.
Reder, Thomas L.: *See*—
Nyquist, Richard A.; and Reder, Thomas L., 3,770,695.
Redmore, Derek, to Petrolite Corporation. Quaternary full nitrogen-heterocyclic phosphonates. 3,770,750, Cl. 260-294.80r.
Redskin Engines Company: *See*—
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Reed, Norman Leonard, to AMP Incorporated, mesne. Printed circuit bridging connector. 3,771,100, Cl. 339-17.01m.
Reed, Robert T., to Walton Products, Inc. Electrical contact pins. 3,771,110, Cl. 339-214.00s.
Reeves, Allan C., to Foremost-McKesson, Inc. Beverage container with straw hole. 3,770,185, Cl. 229-17.00g.
Regie Nationale des Usines Renault: *See*—
Edme, Georges; Fichot, Robert; and Oberle, Georges, 3,769,851.
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Rehman, Warren C.: *See*—
Makwinski, John A.; Rehman, Warren C.; and Spotholz, Clifford H., 3,770,457.
Reich, Theobald: *See*—
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Reimers, James L., to FMC Corporation. Gated carrier for hydrostatic cooker. 3,770,104, Cl. 198-131.000.
Reiner, Lawrence L. Tethered ball tic tac toe. 3,770,273, Cl. 273-101.000.
Reister, Richard A. Electronic celestial navigation means. 3,769,710, Cl. 33-320.000.
Reliable Automatic Sprinkler Company Inc., The: *See*—
Juliano, Richard F., 3,770,063.
Reliable Machine Works, Inc.: *See*—
Kaufman, Aaron M., 3,769,666.
Reliance Electric Company: *See*—
Loshbough, Richard C., 3,770,069.
Remco Industries, Inc.: *See*—
Crosman, Dorland L., 3,769,745.
Remec, Matthew Joseph, to Bell Telephone Laboratories, Incorporated. Magnetically responsive fluid switch. 3,771,080, Cl. 335-51.000.
Reni, Cesare; and Lugo, Luigi, to Societa Italiana Resine S.p.A. Process of preparing stabilized aqueous formaldehyde solutions. 3,770,830, Cl. 260-606.000.
Renz, Willi: *See*—
Fiedler, Horst; Fricker, Ludwig; and Renz, Willi, 3,769,952.
Republic Steel Corporation: *See*—
Kloske, Richard A.; and Barclay, William F., 3,770,426.
Requardt, Heiko: *See*—
Spengler, Erich; and Requardt, Heiko, 3,771,047.
Researcheentrum Ogemat N.V.: *See*—
Attma, Gusbertus, 3,771,103.
Resistoflex Corporation: *See*—
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Reske, Eckart; Cherdron, Harald; Brinkmann, Ludwig; and Herwig, Walter, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Process for the manufacture of cellular plastics from polyamides. 3,770,669, Cl. 260-2.50d.
Rex Chainbelt Inc.: *See*—
Quast, Gilbert W.; Poheim, Walter; and Schultz, Ernest J., 3,770,132.
Reychem Corporation: *See*—
Evans, Joseph H.; and Will, Gareth W., 3,770,556.
Reznar, Josef: *See*—
Kralowetz, Bruno; Braunwieser, Johann; and Reznar, Josef, 3,769,825.
Rhee, Jhoon Goo. Protective shoe. 3,769,722, Cl. 36-2.00r.
Rheinische Kalksteinwerke GmbH: *See*—
Wuhrer, Josef; Kurczyk, Heinz Georg; and Ottenheym, Adrian, 3,770,475.
Rhodes, Alex: *See*—
Kitzner, Ernest W.; Rhodes, Alex; and Shachter, Moses, 3,770,389.
Rhodes, Robin: *See*—
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Rhone-Poulenc S.A.: *See*—
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Richards, Ronald Francis John: *See*—
Langley, Robert; Richards, Ronald Francis John; and Warwick, William Gill, 3,770,474.
Richardson, Byron L., to United Merchants and Manufacturers, Inc. Creaseproofing cellulose-based fabrics. 3,770,489, Cl. 117-76.00t.
Richardson Company, The: *See*—
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Richmond, William James: *See*—
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Ricoh Co., Ltd.: *See*—
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Fukushima, Yoshio, 3,770,344.
Riddle, Eugene J.: *See*—
Murdock, Joseph Kelso; and Riddle, Eugene J., 3,770,000.
Riegel Paper Corporation: *See*—
Cote, Raymond A., 3,770,116.
Rieke Corporation: *See*—
Smith, Rulo Wayne, 3,769,964.
Riendeau, William P., to Aiken Industries, Incorporated. Circuit breaker, trip mechanism and method for manufacturing same. 3,771,087, Cl. 337-112.000.
Riera, Antonio Cortes, to Sociedad Anonima Metalorte. Improvements applied in the manufacture of lamps. 3,770,953, Cl. 240-73.0bj.
Rieter Machine Works, Ltd.: *See*—
Schietknecht, Adolf, 3,769,785.
Riew, Changkiu K. Phenol terminated carboxy containing diene elastomers. 3,770,698, Cl. 260-47.0up.
Riggs, David K., to American Fire Apparatus Co. Fire fighting apparatus. 3,770,062, Cl. 169-24.000.
Rightmire, Robert A.; Metcalfe, Joseph E., III; and Benak, James L., to Standard Oil Company, The. Electrical energy storage device containing a tellurium additive. 3,770,506, Cl. 136-20.000.
Rikagaku Kinkyusho: *See*—
Tateno, Haruo; and Ichimiya, Torao, 3,770,935.
Riley, Kenneth L.; and Sawyer, Willard H., to Esso Research and Engineering Company. Hydrodesulfurization with a specified pore size distribution in silica-stabilized alumina. 3,770,617, Cl. 208-216.000.
Ring, John Joseph: *See*—
Buchan, William Arthur; and Ring, John Joseph, 3,771,114.
Rink, Helm Arthur, to Resistoflex Corporation. Constrictable tube valve with anti-cracking tube arrangement and tube therefor. 3,770,023, Cl. 138-121.000.
Ritchie, Kim: *See*—
Crowe, William J.; Ritchie, Kim; and Gurev, Harold S., 3,770,499.
Rittel, Werner: *See*—
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RIV-SKF Officine di Villar Perosa S.p.A.: *See*—
Camosso, Domenico, 3,770,305.
Veglia, Bartolomeo, 3,770,992.
Rively, Clair M.; and Petro, James, to Westinghouse Corporation. Apparatus for sculpturing an indicia or decorative design in the surface of an article with a beam of corpuscular energy. 3,770,936, Cl. .
Roach, William F., to Kingsley Dryer Corporation. Textile treatment apparatus. 3,769,817, Cl. 68-5.00d.
Roach, William J., to Oxford Laboratories. Motorized liquid dispenser with an accurate dispensing volume adjustment. 3,770,169, Cl. 222-309.000.
Robbins, Dwight M.: *See*—
Trahanovsky, Walter; and Robbins, Dwight M., 3,770,778.
Robbins, Robert; and Boswell, Benjamin C., Jr., to United States of America, Army, mesne. Direct production of beta-HMX. 3,770,721, Cl. 260-239.0hm.
Roberk Company, The: *See*—
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Robertshaw Controls Company: *See*—
Fox, Donnell H., 3,769,933.
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McIntosh, Harold A., 3,770,977.
Sliger, Boyd P., 3,771,088.
Robinson, Albert Sidney; Loukes, David Gordon; and Lawrenson, Jack, to Pilkington Brothers, Limited. Manufacture of wired glass or molten metal bath. 3,770,406, Cl. 65-51.000.
Robinson, James M.; and Lyman, John B., to Whirlpool Corporation. Control apparatus for an ice maker. 3,769,809, Cl. 62-137.000.

Robinson, Thomas C., to United States of America, Health, Education and Welfare, mesne. Intra-aortic balloon system. 3,769,960, Cl. 128-1.00d.

Roche, William J.; and Waymouth, John F., to GTE Sylvania Incorporated. Lighting system including positive volt-ampere discharge lamp. 3,771,013, Cl. 315-101.000.

Rockefeller, Winston G., to Colgate-Palmolive Company. Internal partitioning of compartmented cases. 3,770,184, Cl. 209-15.000.

Rocklin, Albert L., to Shell Oil Company. Nitro-substituted butyl ester. 3,770,805, Cl. 260-482.00r.

Rocklin, Albert L., to Shell Oil Company. Nitro-substituted propyl ester. 3,770,806, Cl. 260-482.00r.

Rockwell International Corporation: *See—*
Darnell, Alfred J., 3,770,422.
Fayling, Clarence D.; Van Horn, John W.; and Ray, Philip M., 3,770,090.
Fugman, Robert L.; and Jezuit, Leslie J., 3,769,909.
McCoy, Lowell R., 3,770,605.
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Rocla Concrete Pipes Limited: *See—*
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Roess, Dieter, to Siemens Aktiengesellschaft. Harmonic readout of a volume hologram in an optically reversible medium. 3,770,336, Cl. 350-3.500.

Rogell, Martin L., to United Nuclear Corporation. Nuclear fuel element with strengthening during shipment. 3,770,582, Cl. 176-78.000.

Rogers, William H.; and Peterson, Evald O. Profile sewing apparatus. 3,769,924, Cl. 112-121.290.

Roggero, Alberto, to FIAT Societa per Azioni. Battery powered vehicle traction system. 3,771,036, Cl. 318-139.000.

Rohm & Haas Company: *See—*
Walker, Robert W.; and Gehlhaus, Paul H., 3,770,524.

Rohm and Haas Company: *See—*
Emmons, William D.; and Swift, Graham, 3,770,801.

Rohm, Gunter Horst. Machinist vise with independent hydraulic-cylinder structure. 3,770,260, Cl. 269-23.000.

Rojahn, Fred H. Method of making a stringer for a slide fastener. 3,770,862, Cl. 264-148.000.

Rollmann, Louis Deane; and Srinivasan, Sundaresa, to Mobil Oil Corporation. Method of producing hydroxyamides and reaction products thereof. 3,770,781, Cl. 260-404.000.

Romito, Vincent A.; and Hanna, Arthur W., to Sterilizer Control Royalties (a trust). Dummy can vehicle for an indicator device in canned goods sterilizing or cooking operations. 3,769,932, Cl. 116-114.00v.

Roos, Ernst: *See—*
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Roper, Don Albert: *See—*
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Roper, Robert; and Rowe, Charles A., Jr., to Esso Research and Engineering Company. Coating composition. 3,770,702, Cl. 260-73.00r.

Rose, Charles R.; and Artiano, George E. Apparatus for playback of sound from microfiche. 3,770,909, Cl. 179-100.30b.

Rose, Charles R.; and Artiano, George E. Apparatus for recording sound on microfiche. 3,770,910, Cl. 179-100.30b.

Rose, John Brewster: *See—*
Leslie, Victor Jeffrey; and Rose, John Brewster, 3,770,832.

Roselius, Wilhelm; Vitzthum, Otto; and Hubert, Peter, to HAG Aktiengesellschaft. Process for the removal of undesirable irritants from raw coffee beans. 3,770,456, Cl. 426-354.000.

Rosenbaum, Barry M.: *See—*
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Rosenhagen, William: *See—*
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Rosenstein, Nathan; and Rosenstein, Abraham J., 1/3 to Hartford Spinning (Canada) Ltd. and 2/3 to Hartford Fibres Ltd. Compact multi-filament textile yarn and method of making the same. 3,769,787, Cl. 57-144.000.

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Ross, Charles W., to Leeds & Northrup Company. Method for calculating the average value of a noise corrupted signal. 3,771,167, Cl. 444-1.000.

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Rostrom, Eric G., to Turbo Power and Marines Systems, Inc., mesne. Multipressure steam system for unifired combined cycle powerplant. 3,769,795, Cl. 60-106.000.

Rosztoczy, Ferenc E.; Casau, Celestin J.; and Kinoshita, Joshyo, to Varian Associates. Method of making gallium arsenide semiconductive devices. 3,770,518, Cl. 148-171.000.

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Rowen, John Howard: *See—*
Chen, Yen-Sun; Fukui, Hatsuaki; Gordon, Eugene Irving; Krupka, Dan Charles; and Rowen, John Howard, 3,771,008.

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RTE Corporation: *See—*
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Rubery, Owen & Co., Limited: *See—*
Merchant, Thomas Harry; Ward, Peter Thomas; and Terence, Richard, 3,770,309.
Ward, Peter Thomas; Smith, Richard Terece; and Siverns, Donald, 3,770,076.

Rubis, Casimir Joseph. Drift correcting servo. 3,771,038, Cl. 318-636.000.

Ruf, Erich, to Goldschmidt, Th., A.G. Process for producing thiophosphoric acid triesters. 3,770,853, Cl. 260-981.000.

Rumsey, Thomas R.: *See—*
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Ruof, Edgar J., to Goodyear Tire & Rubber Company, The. Wheel speed transducer frequency doubling circuit. 3,770,327, Cl. 303-21.00r.

Russell, Carl D., to Aquarius, Inc. Method and apparatus accommodating panel construction. 3,770,310, Cl. 294-64.00r.

Russell, Kenneth L., to Cities Service Oil Company. Method for detecting geopressures. 3,770,378, Cl. 23-230.0ep.

Ryan, Allen L., to Warwick Electronics, Inc. Cassette changer. 3,770,282, Cl. 274-4.00f.

Rynbrandt, Ronald H., to Upjohn Company, The. Alkylthio and phenylthio cyclopropylamines from the reaction of chloromethyl sulfides with enamines. 3,770,747, Cl. 260-293.730.

S & C Electric Co.: *See—*
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Sabatino, Anthony, to Gould, Inc. Making electrical connections through a storage battery wall. 3,770,510, Cl. 136-134.00r.

Saddler, Richard L.: *See—*
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Safety Systems, Inc.: *See—*
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Safir, Sidney Robert: *See—*
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Sagarin, Philip H., to VCA Corporation. Childproof actuator cap for aerosol and like dispensing devices. 3,770,168, Cl. 222-182.000.

Sagawa, Akio; and Kawakami, Hideaki, to Hitachi, Ltd. Light amplifier for use in optical communication system. 3,770,966, Cl. 250-205.000.

Saint-Martin, Bernard, to LaCalhene. Protective clothing for an operator working in a hermetic enclosure. 3,769,972, Cl. 128-142.500.

Saito, Shigeru: *See—*
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Sajar Plastics, Inc.: *See—*
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Sakata, Hiroshi: *See—*
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Sakata, Kaoru; Asada, Yosiharu; and Okamura, Yasuhiro, to Teijin Limited. Drawing polyester filaments using as a snubing means a heated roller driven at the feed rate speed. 3,770,866, Cl. 264-290.00t.

Sakazaki, Tadazumi: *See—*
Uno, Naoyuki; Nomura, Katsuhiko; Sakazaki, Tadazumi; Watanabe, Koichiro; Miyata, Katsuhiko; and Urano, Fumio, 3,769,886.

Salem Corporation: *See—*
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Salminen, Ilmari Fritiof: *See—*
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Salomon, Georges Pierre Joseph. Safety strap system for skis and a method of arranging same. 3,770,288, Cl. 280-11.35n.

Samuels, Abe; and Wiggerman, Roger A., to Speed-O-Print Business Machine Corporation. Squeegie assembly for photocopy machines. 3,769,896, Cl. 95-89.00a.

Sanders Associates, Inc.: *See—*
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Sanders Nuclear Corporation: *See—*
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Sanders, Ralph. Air heating device for artists air brush. 3,770,201, Cl. 239-135.000.

Sandler, Yehuda L., to Westinghouse Electric Corporation. Cathodic activation of gas diffusion electrodes. 3,770,508, Cl. 136-86.00a.

Sandoz Ltd.: *See—*
Bourquin, Jean-Pierre; Schwarb, Gustav; and Waldvogel, Erwin, 3,770,728.
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Santa Fe International Corporation: *See—*
Christopher, John, 3,770,927.

Sanwa Tetsuki Kougiyou Kabushiki Kaisha: *See*—
Noda, Hiroshi, 3,769,685.

Sarver, Jack Kenneth: *See*—
Martin, Don Leo; and Sarver, Jack Kenneth, 3,770,053.

Sato, Akira: *See*—
Shiba, Keisuke; Takei, Haruo; Sato, Akira; and Ikeda, Tadashi, 3,770,449.

Sato, Akira; Shiba, Keisuke; and Hinata, Masanao, to Fuji Photo Film Co., Ltd. Spectrally sensitized photographic silver halide emulsion. 3,770,440, Cl. 96-139.000.

Sato, Hisatake: *See*—
Araki, Yoshihiko; Sato, Hisatake; and Takahashi, Mikio, 3,770,674.

Sato, Ryosuke: *See*—
Fujiwhara, Mitsuto; Sato, Ryosuke; Koga, Tadaaki; and Matsuo, Shunji, 3,770,436.

Sato, Shui; Hanzawa, Teruo; Furuya, Masaaki; Endo, Takaya; and Inoue, Isaburo, to Koniskiroku Photo Industry Co., Ltd. Color photographic silver halide material containing acetanilide couplers. 3,770,446, Cl. 96-100.000.

Sato, Toshio: *See*—
Katsumi, Mamoru; Sato, Toshio; Yanagawa, Yasuo; and Hara, Tadao, 3,770,471.

Satomura, Masato: *See*—
Osada, Chiaki; Satomura, Masato; and Ono, Hisatake, 3,770,443.

Sattler, Walter J., to General Motors Corporation. Motor vehicle automatic hazard warning system. 3,771,122, Cl. 340-62.000.

Sauter, Charles Frank. Scoring device and counter therefor. 3,770,193, Cl. 235-117.00r.

Sautter, Werner; and Gilak, Ahmad, to Vereinigte Aluminium-Werke Aktiengesellschaft. Process for coloring the surface of aluminum work-pieces by anodization. 3,770,600, Cl. 204-58.000.

Savin Business Machines Corporation: *See*—
Hastwell, Peter J., 3,770,972.

Sawatzky, Erich; and Street, George Bryan, to International Business Machines Corporation. Ferromagnetic material. 3,770,395, Cl. 29-194.000.

Sawyer, Willard H.: *See*—
Riley, Kenneth L.; and Sawyer, Willard H., 3,770,617.

Sayles, David C., to United States of America, Army. Combustion composition containing a ferrocenyl or carboranyl derivative. 3,770,526, Cl. 149-22.000.

Scaife, Peter Hansen: *See*—
Swinkels, Dominicus Adrianus Johannes; Scaife, Peter Hansen; and Lean, John Barry, 3,770,868.

Scarbrough, Alfred D., to Bunker Ramo Corporation. 3D-Coaxial memory construction and method of making. 3,769,702, Cl. 29-627.000.

Scarnato, Thomas J.; Dryan, James J.; Nicholson, James J.; and Falanga, Anthony J., to International Harvester Company. Row crop puller-shredder. 3,770,064, Cl. 171-58.000.

Schachinger, Martin: *See*—
Kohl, Arno; Schachinger, Martin; Kindl, Helmut; and Hintringer, Otmar, 3,771,067.

Schaeffer, John I. Swimming pool cleaning system. 3,769,993, Cl. 134-167.00r.

Schafer, Kugelfischer Georg, & Co.: *See*—
Brand, Karl, 3,769,690.

Schanne, Joseph Francis; and Nickl, Franklyn George, to RCA Corporation. Article identification apparatus. 3,770,944, Cl. 235-61.11e.

Scheber, George D. Recreational device. 3,769,929, Cl. 115-1.00r.

Scherhag, Bernhard; Wolz, Hermann; and Von Friedrich, Adolf, to Bayer Aktiengesellschaft. Production of 2-mercaptobenzthiazole. 3,770,759, Cl. 260-306.000.

Schering Aktiengesellschaft: *See*—
Hofmeister, Helmut; Laurent, Henry; Prezewowsky, Klaus; Wiechert, Rudolf; and Steinbeck, Hermann, 3,770,726.

Schering Corporation: *See*—
Walter, Lewis A., 3,770,737.

Scherrer, William A. Rotary engines. 3,769,946, Cl. 123-8.470.

Schiatter, Gerald Lance, to International Telephone and Telegraph Corporation. Densitometer. 3,769,831, Cl. 73-32.000.

Schick, Incorporated: *See*—
Brenneman, J. Edward; and Enders, Ray H., 3,770,950.

Schietknecht, Adolf, to Rieter Machine Works, Ltd. Rotor of an open end spinning device. 3,769,785, Cl. 57-58.890.

Schild, Edwin F., to Airway Products Corporation. Shelving construction. 3,770,135, Cl. 211-148.000.

Schilling, Walter W., to MacMillan Bloedel, Limited. Veneer clipping apparatus. 3,769,867, Cl. 83-338.000.

Schladitz, Hermann J. Method of manufacture of materials from polycrystalline filaments. 3,770,492, Cl. 117-107.200.

Schlafhorst, W., & Co.: *See*—
Kupper, Willi, 3,770,220.

Schluckebier, Floyd A., to General Motors Corporation. Fastener device. 3,769,853, Cl. 74-543.000.

Schmid, Alan H.: *See*—
Furlong, Dale A.; and Schmid, Alan H., 3,769,922.

Schmid, Ludwig: *See*—
Frings, Horst; Braun, Gunter; Mosle, Ernst; and Schmid, Ludwig, 3,769,860.

Schmidt, Adolf: *See*—
Knauf, Alfons; Hartmann, Peter; Schmidt, Adolf; and Wirsching, Franz, 3,770,468.

Schmied, Wilhelm: *See*—
Haffner, Helmut Hubert; Kannheiser, Lothar Karl; and Schmied, Wilhelm, 3,771,108.

Schmitt, Armin, to Pelzholdt, J. S., Firma. Mixing, homogenizing and emulsifying apparatus. 3,770,249, Cl. 259-4.000.

Schmitt, Dieter: *See*—
Baumer, Wilhelm; Schmitt, Dieter; and Stein, Alfred, 3,770,379.

Schmitt, Dieter; Stein, Alfred; and Baumer, Wilhelm, to Merck Patent Gesellschaft mit beschrankter Haftung. Process for the determination of peroxides. 3,770,381, Cl. 23-230.00r.

Schneider, Alfred: *See*—
Gray, John H.; Schneider, Alfred; Cormak, Anthony F.; and Ayers, Arnold L., 3,770,612.

Schneider, Irwin. Three dimensional optical information storage system. 3,771,150, Cl. 340-173.0cc.

Schneider, Rupert, to Sandoz Ltd. 2-Imino-5-alkylamino-1,3-dithianes. 3,770,769, Cl. 260-327.00m.

Schnur, Joel M.: *See*—
Goldberg, Lawrence S.; and Schnur, Joel M., 3,771,065.

Schober, Johann. Oscillatory screening apparatus with vertical screen channel. 3,770,125, Cl. 209-252.000.

Scholtis, Walter: *See*—
Ploch, Siegfried; Scholtis, Walter; Gerischer, Heini; Zschunee, Heinz; and Dietrich, Karl-Heinz, 3,769,815.

Scholz, Egbert: *See*—
Gehring, Christoph W.; Scholz, Egbert; and Strauss, Wolfgang, 3,770,610.

Schonhorn, Harold: *See*—
Craft, William Henry; and Schonhorn, Harold, 3,770,531.

Schoolar, Richard B.; Lequin, Doris S.; Mathews, Harry E., Jr.; and Culpepper, Ronald N., to United States of America, Navy. Plastic mounting of epitaxially grown IV-VI compound semiconducting films. 3,770,565, Cl. 161-184.000.

Schrank, Martin P., to GTE Sylvania Incorporated. Method of suppressing hydrogen absorption in tungsten filaments. 3,769,670, Cl. 29-25.110.

Schreiner, Horst: *See*—
Hassler, Heinrich; and Schreiner, Horst, 3,770,497.

Schubart, Riidiger; Roos, Ernst; and Abele, Manfred, to Bayer Aktiengesellschaft. N,N'-thio-bis-carbamic acid amides. 3,770,826, Cl. 260-558.00s.

Schuette, Roland J., Jr., to Triangle Mfg. Co., Inc. Bur extractor. 3,769,660, Cl. 19-202.000.

Schulte, Rudolf R. Physiological drainage system with closure means responsive to downstream suction. 3,769,982, Cl. 128-350.000.

Schulte, Walter: *See*—
Boie, Immo; Schulte, Walter; Pelz, Willibald; Krimm, Heinrich; Freitag, Dieter; and Nittel, Fritz, 3,770,447.
Pelz, Willibald; Credner, Hans-Heinrich; Schulte, Walter; Klein, Alfons; Wedemeyer, Karlfried; and Nittel, Fritz, 3,770,445.

Schultenkamper, Josef, to Gelendwellenbau GmbH. Sealing system for a roller bearing or the like. 3,770,993, Cl. 308-187.200.

Schultz, Ernest J.: *See*—
Quast, Gilbert W.; Poheim, Walter; and Schultz, Ernest J., 3,770,132.

Schumacher, Robert L.: *See*—
Gibson, James O.; Schumacher, Robert L.; and Gore, Thomas W., 3,770,487.

Schumann, Paul A., Jr.: *See*—
Duffy, Michael C.; Schumann, Paul A., Jr.; and Yeh, Tsu-Hsing, 3,770,516.

Schuppner, Harry R., Jr., to Kelco Company. Cold milk custard-type pudding. 3,770,462, Cl. 426-186.000.

Schuster, Frank. Cleaning and removal device. 3,770,204, Cl. 239-288.500.

Schwab, Frederick C., to Mobil Oil Corporation. Slurry process for producing styrene homopolymers and block polymers thereof using anionic catalysts. 3,770,712, Cl. 260-93.500.

Schwarb, Gustav: *See*—
Bourquin, Jean-Pierre; Schwarb, Gustav; and Waldvogel, Erwin, 3,770,728.

Schwartz Chemical Company, Incorporated: *See*—
Schwartz, George C., 3,770,373.

Schwartz, George C., to Schwartz Chemical Company, Incorporated. Drycleaning deodorizing and disinfecting compositions and processes. 3,770,373, Cl. 8-142.000.

Schweikert, Wilbur H.; and Mosier, John S. Gas distributor for casting mold manufacture. 3,770,211, Cl. 239-567.000.

Schweissindustrie Oerlikon Buhrle AG: *See*—
Gloor, Karl; and Halter, Eugen, 3,770,959.

Science Spectrum, Inc.: *See*—
Wyatt, Philip J., 3,770,351.

Scolatti, Charles A.: *See*—
Von Ohain, Hans J. P.; and Scolatti, Charles A., 3,770,227.

Scott, Joseph James, to Short Brothers & Harland Limited. Composite panel structures. 3,769,767, Cl. 52-145.000.

Scott Paper Company: *See*—
DeNight, George G.; Farber, James F.; Glodek, John J.; and Higgins, Margaret D., 3,769,978.
Jones, Drexel D., 3,770,118.

Scott, Robert H.; and Lockhart, Hildred B., to Celanese Corporation. Process for inhibiting corrosion. 3,770,377, Cl. 21-2.70r.

Scovill Manufacturing Company: *See*—
Cooper, Joseph, 3,769,667.

Seaquist Valve Company: *See*—

Ewald, Ronald F., 3,770,167.

Searle, G. D., & Co.: *See*—
Collins, Paul W.; and Pappo, Raphael, 3,770,776.
Cusic, John W.; and Le Von, Ernest F., 3,770,763.

Sebastian, Ronald Joseph; and Walker, David Albert, to AMP Incorporated. Barrier guard. 3,769,855, Cl. 74-612.000.

Sebring John G.: *See*—
Brooks, Frank W.; and Sebring John G., 3,770,082.

Seefluth, Owe C. Toy airplane. 3,770,229, Cl. 244-154.000.

Seegmiller, David W.: *See*—
Brabson, George Dana, Jr.; King, Lowell A.; Seegmiller, David W.; and Fannin, Armand A., Jr., 3,770,503.

Seidel, Kathe, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V. System for purification of polluted water. 3,770,623, Cl. 210-2.000.

Seiner, Jerome A., to PPG Industries, Inc. Electrodeposition over nonconductive primers. 3,770,604, Cl. 204-181.000.

Sekine, Yutaka: *See*—
Matsumoto, Jon-Ichi; Sekine, Yutaka; Takase, Yoshiyuki; and Nakamura, Shinichi, 3,770,742.

Sela, Michael: *See*—
Shaltiel, Shmuel; and Sela, Michael, 3,770,584.

Selbsi, Gunter: *See*—
Muller, Fritz; Queck, Robert; Koch, Josef; Kowalski, Werner; Nolden, Werner; Selbsi, Gunter; and During, Helmut, 3,770,207.

Selectivend Inc. mesne: *See*—
Guthrie, Edward H., 3,770,163.

Self, Joseph A.; Sovereign, Gerald W.; and Peacock, Alton E., to Monsanto Company. Method of making a helically crimped continuous filament yarn. 3,769,669, Cl. 28-72.100.

Sellers, Jerry W.; and Taylor, Robert W., to Rockwell International Corporation. Combination bearing seat for motors. 3,770,331, Cl. 308-72.000.

Serov, German Vasilievich: *See*—
Kassir, Gennady Andreevich; Temnikov, Evgeny Markovich; Umrilov, Nikolai Fedorovich; Kurenkov, Ivan Ivanovich; Lukyanchikov, Vyacheslav Grigorievich; Guryanov, Viktor Artemievich; Ivashkin, Vasily Alexeevich; and Serov, German Vasilievich, 3,770,212.

Servanty, Guy Emile Louis, to Societe d'Etudes et de Recherches Appliquees S.E.R.A.P. Machine tool for machining components with toroidal sliding surfaces. 3,769,878, Cl. 90-20.000.

Setele, William O., to Kendale Industries, Inc. Linkage mechanism. 3,770,157, Cl. 217-44.000.

Setnikar, Ivo: *See*—
Sianesi, Enrico; Da Re, Paolo; Setnikar, Ivo; and Massarani, Elena, 3,770,733.

Sexton, James H.; Slover, Vasel R., Jr.; Patton, Bobbie J.; and Gravley, Wilton, to Mobil Oil Corporation. Logging-while-drilling tool. 3,770,006, Cl. 137-499.000.

Shachter, Moses: *See*—
Kitzner, Ernest W.; Rhodes, Alex; and Shachter, Moses, 3,770,389.

Shadburn, Whelchel Artis, to Sparton, Management Services, Inc. Pickup truck cab with retractable or removable rear window. 3,770,312, Cl. 296-28.00c.

Shaffer, John W., to GTE Sylvania Incorporated. Moisture indicator for photoflash lamp. 3,770,362, Cl. 431-13.000.

Shaffer, Thomas N.; Wilson, Charles R.; and Wright, Lawrence G., to Westinghouse Electric Corporation. Transducer installation. 3,771,117, Cl. 340-8.00r.

Shaltiel, Shmuel; and Sela, Michael, to Beecham Group Limited. Pronase purification. 3,770,584, Cl. 195-2.000.

Shannon, Michael J.; and Sheldon, George C. Structural truss construction with membrane coverings. 3,769,771, Cl. 52-634.000.

Sharpe, Verlos G., to General Motors Corporation. Method for sanitizing a domestic clothes washer. 3,770,376, Cl. 8-158.000.

Shaw, D. William. Solid state thyratron. 3,770,989, Cl. 307-305.000.

Sheets, Herbert D., Jr.; Meyer, Ronald A.; and O'Hara, Martin J., to Litton Industries, Inc. Phosphate-bonded grinding wheel. 3,770,401, Cl. 51-308.000.

Sheldon, George C.: *See*—
Shannon, Michael J.; and Sheldon, George C., 3,769,771.

Shell Oil Company: *See*—
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Dautzenberg, Frits M.; Kouwenhoven, Herman W.; and Naber, Jaap E., 3,770,647.
Rocklin, Albert L., 3,770,805.
Rocklin, Albert L., 3,770,806.
White, Ellis R., 3,770,795.

Shepherd, Lawrence H., Jr., to Ethyl Corporation. Cyclopropane process. 3,770,840, Cl. 260-666.00r.

Shepherd, Roy Earl. Automatic safety coupling device. 3,770,300, Cl. 280-511.000.

Sheptak, Nicolas: *See*—
Swearingen, Charles C.; and Sheptak, Nicolas, 3,770,570.

Sherman, Russel G., to Lamson & Sessions Co., The. Fastener. 3,770,036, Cl. 151-41.700.

Sherman, Warren S., to General Motors Corporation. Reduction drive for electric axle. 3,770,074, Cl. 180-65.00f.

Sherr, Allan Ellis, to American Cyanamid Company. Amimonium and diimonium salts used as polymerization inhibitors of diallyl digylcol carbonate. 3,770,793, Cl. 260-463.000.

Sherwen, Theo: *See*—
Ivemy, Alan; Sherwen, Theo; and Pentelow, Tony, 3,770,202.

Sherwood Medical Industries Inc.: *See*—
Muench, Lloyd D., 3,769,984.
Weichselbaum, Theodore E., 3,770,477.

Shiba, Keisuke: *See*—
Sato, Akira; Shiba, Keisuke; and Hinata, Masanao, 3,770,440.

Shiba, Keisuke; Takei, Haruo; Sato, Akira; and Ikeda, Tadashi, to Fuji Photo Film Co., Ltd. Spectrally sensitized silver halide photographic emulsion. 3,770,449, Cl. 96-124.000.

Shibata Kagaku Kikai Kogyo Kabushiki Kaisha: *See*—
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Shichijo, Yoshihisa; Ichikawa, Yasushi; Sugaya, Yoshiharu; and Ueda, Takeshi, to Asahi Kasei Kogyo Kabushiki Kaisha. Modified acrylonitrile polymer fibers. 3,770,494, Cl. 117-138.8ua.

Shinomiya, Eiichi: *See*—
Oshida, Yasunosuke; Okamoto, Seisho; and Shinomiya, Eiichi, 3,770,329.

Shionogi & Co., Ltd.: *See*—
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Makisumi, Yasuo, 3,770,745.

Shiovitz, Nathan N.: *See*—
Forsyth, John P.; Forsyth, Robert W.; Holcomb, Donald R.; and Shiovitz, Nathan N., 3,770,060.

Shipley Company, Inc.: *See*—
Dutkewych, Oleh B.; and Hofman, Lebert A., 3,770,464.

Shoe, Theodore W., to Flexicore Co., Inc., The. Apparatus for stripping slab casting forms. 3,770,360, Cl. 425-440.000.

Shone, Robert T.: *See*—
Ambrose, Walter R.; Shone, Robert T.; and Welham, Brian H., 3,770,347.

Shono, Kinji, to Nissan Motor Company, Limited. Friction-engaging device. 3,770,088, Cl. 192-70.270.

Short Brothers & Harland Limited: *See*—
Scott, Joseph James, 3,769,767.

Short, Herbert M.: *See*—
Spear, Robert E.; Ormesher, Robert J.; and Short, Herbert M., 3,770,420.

Short, James N.: *See*—
Zelinski, Robert P.; Short, James N.; Gath, Rudolph H.; and Zuech, Ernest A., 3,770,713.

Short, Oliver A., to Du Pont de Nemours, E. I., and Company. Elimination of dielectric degradation in printed gold/dielectric/palladium-silver structures. 3,770,496, Cl. 117-212.000.

Shortt, Brian A.: *See*—
Cohen, Leonard D.; Shortt, Brian A.; and Urban, Michael J., 3,771,044.

Shreeve, Nicholas Gilbert. Electrophotographic copying, printing or reproducing method. 3,770,484, Cl. 117-37.01e.

Sianesi, Enrico; Da Re, Paolo; Setnikar, Ivo; and Massarani, Elena, to RECORDATI SA Shemical and Pharmaceutical Company. Novel therapeutically active dihydrobenzothiazine-s-dioxides and processes for preparing them. 3,770,733, Cl. 260-243.00r.

Sianesi, Enrico, to Recordati Sa-Chemical and Pharmaceutical Company. Method for preparing 3-propionylsalicylic acid and derivatives thereof. 3,770,802, Cl. 260-473.900.

Siddall, John B.: *See*—
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Siemens Aktiengesellschaft: *See*—
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Klein, Heinrich; Pieper, Rudolf; and Hoffmann, Alfred, 3,769,781.
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Maier, Eberhard; Endler, Walter; and Haack, Paul, 3,770,217.
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Siepmann, Walter, to Siepmann-Werke KG. Gate valve. 3,769,673, Cl. 29-157.10r.

Siepmann-Werke KG: *See*—
Siepmann, Walter, 3,769,673.

Sigman, Theodore. Photolettering apparatus. 3,769,884, Cl. 95-4.500.

Sill, Floyd E., to Banctec, Incorporated. Check processing tab. 3,770,943, Cl. 235-61.12r.

Silver, H. Graham; Heller, Adam; Gardner, Phillip J.; and Argue, Gary R., to GTE Laboratories Incorporated. Electrode discharge device with electrode-activating fill. 3,771,009, Cl. 313-228.000.

Silver, Spencer F.: *See*—
Knoepfel, Hanspeter; and Silver, Spencer F., 3,770,708.

Sim-Kar Lighting Fixtures Co.: *See*—
Trowbridge, Charles A., 3,770,952.

Simmons Company: *See*—
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Simmons, Edward E.: *See*—
Brumfield, Robert C.; and Simmons, Edward E., 3,770,129.

Simmons, Harold T.: *See*—
Murray, Stephen F.; and Simmons, Harold T., 3,771,102.

Simo, Miroslav Andrew. Arrow rest for archery bow. 3,769,956, Cl. 124-41.000.

Sinfield, Frederick: *See*—
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Singer Company, The: *See*—
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Dietrich, Arnold K.; and Nott, William H., 3,771,011.

Singer Company, The, mesne: *See—*
Rakowsky, Edward L., 3,769,875.

Singer, William; and Driscoll, Alfred E., to Troy Chemical Corporation. Latex compositions containing bodying agents. 3,770,684, Cl. 260-29.7nr.

Sinkovitz, Gloria Dimarco: *See—*
Slagel, Robert Clayton; and Sinkovitz, Gloria Dimarco, 3,770,673.

Sipple, Lloyd H.; Hughson, Oliver J.; and Lamb, Robert M. Signal warning of insufficient sap in maple sap evaporator pan. 3,771,151, Cl. 340-244.00c.

Siverns, Donald: *See—*
Ward, Peter Thomas; Smith, Richard Terece; and Siverns, Donald, 3,770,076.

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Skatsche, Othmar: *See—*
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Skoures, Alexander E., to United States of America, Navy. Solid state acceleration counter. 3,769,844, Cl. 73-517.00r.

Slagel, Robert Clayton; and Sinkovitz, Gloria Dimarco. Chitosan graft copolymer for making paper products of improved dry strength. 3,770,673, Cl. 260-17.4gc.

Sliger, Boyd P., to Robertshaw Controls Company. Electrical switch construction and control system utilizing the same. 3,771,088, Cl. .

Sloane, R & G, Manufacturing Company, Inc.: *See—*
Kelsey, David H., 3,770,547.

Sloane, Thomas E., Jr.; Hart, William; and Pester, William B., to Mattel, Inc. Telephone toy with phonograph. 3,769,744, Cl. 46-33.000.

Slobodnik, Andrew J., Jr., to United States of America, Air Force. Low velocity zero temperature coefficient acoustic surface wave delay line having group and phase velocity vector coincidence. 3,771,072, Cl. 333-30.00r.

Sloughfy, James L.: *See—*
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Slover, Vasel R., Jr.: *See—*
Sexton, James H.; Slover, Vasel R., Jr.; Patton, Bobbie J.; and Gravley, Wilton, 3,770,006.

Slutsky, Ivan Ivanovich; and Poyarkov, Oleg Petrovich. Overhead transporter and reloader. 3,770,137, Cl. 212-12.000.

Smarook, Walter Henry: *See—*
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Smart, Richard C.; and Swonger, Kenneth D., to Martin Marietta Corporation. Blood pulse measuring employing reflected red light. 3,769,974, Cl. 128-2.05p.

Smedley, William L. Method of introducing fluid treatment to a well. 3,770,058, Cl. 166-310.000.

Smith, Albert L.: *See—*
Cronin, David J.; Pinard, Alward I.; and Smith, Albert L., 3,770,340.

Smith, Claude A., to General Motors Corporation. Infinitely adjustable bearing mounting assembly. 3,770,994, Cl. 308-207.000.

Smith, Edward P., to Ohio Brass Company, The. Ground wire monitoring circuit. 3,771,020, Cl. 317-18.00c.

Smith International, Inc.: *See—*
Liejestrand, Walter E., 3,769,779.

Smith, James R., to United States of America, Army. Article and method for multiple immune adherence assay. 3,770,380, Cl. 23-230.00b.

Smith, Jimmie D. Utility vehicle. 3,770,070, Cl. 180-13.000.

Smith, M. Howe: *See—*
De Angelis, William M.; Luthmann, Reinhardt F.; Meehan, Charles A.; and Smith, M. Howe, 3,770,405.

Smith, Michael Arthur: *See—*
Marks, Colin Elliott; and Smith, Michael Arthur, 3,770,738.

Smith, Richard Terece: *See—*
Ward, Peter Thomas; Smith, Richard Terece; and Siverns, Donald, 3,770,076.

Smith, Roy R., to General Motors Corporation. Lint filter for washing machine. 3,769,818, Cl. 68-18.00f.

Smith, Rulo Wayne, to Rieke Corporation. System and method for accurately measuring arterial blood pressure. 3,769,964, Cl. 128-2.05g.

Smits, Marius. Temperature controlled electric hand soldering iron. 3,770,937, Cl. 219-241.000.

Smittle, Darrell G.; and Karlsen, Asbjorn, to Hardman Aerospace. Selectively adjustable lumbar support for aircraft seats and the like. 3,770,315, Cl. 297-284.000.

Smyser, James A.: *See—*
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Snam Progetti S.p.A.: *See—*
Gordini, Silvano; and Noe, Sergio, 3,770,252.

Snyder, Richard C.; Drueger, Alan F.; and Steder, Henry E., to Pullman Incorporated. Freight bracing apparatus. 3,769,917, Cl. 105-369.00b.

Sociedad Anonima Metalorte: *See—*
Riera, Antonio Cortes, 3,770,953.

Societa Farmaceutici Italia: *See—*
Chiusoli, Gian Paolo; Ferraris, Mario; Baldratti, Giuliana; and Menozzi, Milena, 3,770,775.

Societa Italiana Resine S.p.A.: *See—*
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Societa Italiana Telecomunicazioni Siemens S.p.A.: *See—*
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Delfrate, Egidio Alvazzi, 3,771,071.

Societe Anonyme des Ateliers de Constructions: *See—*
Jacquelin, Guy J.; Hampartzoumain, Robert; and Louvat, Jules, 3,770,126.

Societe Anonyme des Usines Chausson: *See—*
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Societe des Verreries Industrielles Reunies du Loing: *See—*
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Societe d'Etude et de Construction d'Appareils de Precision: *See—*
Martin, Claude R., 3,769,906.

Societe d'Etudes de Machines Thermiques: *See—*
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Societe d'Etudes de Produits Chimiques: *See—*
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Societe d'Etudes et de Recherches Appliquees S.E.R.A.P.: *See—*
Servanty, Guy Emile Louis, 3,769,878.

Societe Generale d'Entreprises: *See—*
Gerard, Paul, 3,769,943.

Solbert, Per: *See—*
Onarheim, Thor; and Solbert, Per, 3,769,900.

Solum, James R., to B&W Incorporated. Apparatus for causing an impact force on the interior of a well pipe. 3,770,054, Cl. 166-177.000.

Solvay & Cie: *See—*
Baugnies, Francis; Bruyere, Jean; and Michel, Edmond, 3,770,098.

Somerset, James P., to Superior Electric Company, The. Rotating shaft encoder. 3,770,971, Cl. 250-231.0se.

Sony Corporation: *See—*
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Kurolawa, Hiromichi; and Kubota, Yasuharu, 3,770,881.

Sorvall, Ivan, Inc.: *See—*
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Sovereign, Gerald W.: *See—*
Self, Joseph A.; Sovereign, Gerald W.; and Peacock, Alton E., 3,769,669.

Spain, Theodore H.; Geimer, Allen F. J.; and Loesche, Victor E., Jr. Mouse trap. 3,769,742, Cl. 43-81.000.

Sparapany, John Joseph: *See—*
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Sparr, Donald J.: *See—*
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Spear, Robert E.; Ormesher, Robert J.; and Short, Herbert M., to Aluminum Company of America. Melting aluminum under special flow conditions. 3,770,420, Cl. 75-68.00r.

Spectrotherm Corporation: *See—*
Winkler, Richard H., 3,770,890.

Speed-O-Print Business Machine Corporation: *See—*
Samuels, Abe; and Wiggerman, Roger A., 3,769,896.

Speedriver Tool Corporation: *See—*
Miller, Leslie T., 3,769,862.

Speidel, Elbert O., to MHI, Inc. Building structure. 3,769,766, Cl. 52-73.000.

Speiser, Jeffrey M.: *See—*
Whitehouse, Harper John; and Speiser, Jeffrey M., 3,770,949.

Spence, Douglas Roy, to Girling Limited. Hydraulic braking systems in vehicles. 3,770,325, Cl. 303-10.000.

Spencer, Denzil Reginald Frank, to Steetley (Mfg.) Limited. Refractory substance. 3,770,467, Cl. 106-58.000.

Spencer, Peter Marvin. Expansible mechanism. 3,769,726, Cl. 40-21.00c.

Spengler, Erich; and Requardt, Heiko, to Volkswagenwerk Aktiengesellschaft. Apparatus for automatic detection of the course or behavior of the ignition voltages with respect to time in a multicylinder combustion engine. 3,771,047, Cl. 324-16.00r.

Sperberg, Lawrence R. Statistical designed experiments. 3,769,843, Cl. 73-432.00r.

Sperry, John D., to Arvin Industries, Inc. Tracking adjustment for magnetic disc recorder. 3,770,905, Cl. 179-100.2ca.

Sperry Rand Corporation: *See—*
McMahon, Donald H., 3,771,124.
McMahon, Donald H., 3,771,129.

Sperry-Sun Well Surveying Company: *See—*
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Spinnler, Rainer: *See—*
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Spoor, Herbert; and Demmler, Kurt, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. System hardenable by ionizing radiation. 3,770,491, Cl. 117-93.310.

Spotholz, Clifford H.: *See—*
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Spurrell, William Gordon, to Midland-Ross of Canada Limited. Method for controlling caliper. 3,770,578, Cl. 162-206.000.

Srinivasan, Sundaresa: *See—*
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Stahl, Filip Torvald, to Stenberg-Flygt AB. Sealing ring for slide-ring seals. 3,770,181, Cl. 277-96.000.

Stahl, Roland E., to Du Pont de Nemours, E. I., and Company. Tufted carpet. 3,770,558, Cl. 161-65.000.
Stamicarbon N.V.: *See—*
Van der Loos, Josef L. M.; and Claassen, Peter J. M. W., 3,770,689.
Standaart, Adrian W. Single gun, multi-beam color cathode ray tube. 3,771,002, Cl. 313-69.00c.
Standard Oil Company: *See—*
Steigelman, Edward F.; and Hughes, Robert D., 3,770,842.
Standard Oil Company, The: *See—*
Rightmire, Robert A.; Metcalfe, Joseph E., III; and Benak, James L., 3,770,506.
Standard Products Company, The: *See—*
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Stang, Paul F., to Lockheed Aircraft Corporation. Ferrite broadband semi-notch antenna. 3,771,157, Cl. 343-708.000.
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Steetley (Mfg.) Limited: *See—*
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Steigelman, Edward F.; and Hughes, Robert D., to Standard Oil Company. Method of separating aliphatically unsaturated hydrocarbons by contacting said hydrocarbons with a solid, water-insoluble, semi-permeable film membrane. 3,770,842, Cl. 260-677.00a.
Stein, Alfred: *See—*
Baumer, Wilhelm; Schmitt, Dieter; and Stein, Alfred, 3,770,379.
Schmitt, Dieter; Stein, Alfred; and Baumer, Wilhelm, 3,770,381.
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Steman, Wolf; and Henes, Steven W., to VCA Corporation. Mixing type liquid dispenser. 3,770,165, Cl. 222-136.000.
Stempel, Guenter: *See—*
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Sterling Moulding Materials Limited: *See—*
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Stern, Mitchel. Brake accessory for rolls of toilet paper and the like. 3,770,221, Cl. 242-55.200.
Stevens, Emerson W., to United States of America, Air Force. By-pass engine having a single, thrust diverter valve mechanism for a V/stol aircraft. 3,769,797, Cl. 60-226.00r.
Stevenson, Billy E.; and Rumsey, Thomas R., to Royal Industries, Inc. Motor vehicle security system and security method. 3,770,324, Cl. 303-9.000.
Stewart, Arthur, Jr. Identification plate. 3,769,725, Cl. 40-10.00r.
Stewart, Aubrey P., Jr.; and Dreier, Clarence R., Jr., to Allied Chemical Corporation. Preparation of a fruit pudding. 3,770,461, Cl. 426-380.000.
Stewart, James A., to GTE Automatic Electric Laboratories Incorporated. Battery charging circuit for subscriber carrier equipment. 3,771,039, Cl. 320-2.000.
Stewart-Warner Corporation: *See—*
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Stobbe, Richard P.; and Knapp, Richard V., to Nilsen Mfg. Co. Liquid flow control arrangement. 3,770,239, Cl. 251-9.000.
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Stohlquist, Roger H., to Anderson Bros. Mfg. Co. Article transfer apparatus. 3,770,096, Cl. 198-21.000.
Stone, Irwin M., to Baxter Laboratories, Inc. Chillproofing of fermented malt beverages. 3,770,454, Cl. 426-12.000.
Stone, Julian; and Walrafen, George Edouard, to Bell Telephone Laboratories, Incorporated. Method utilizing an optical fiber raman cell. 3,770,350, Cl. 356-75.000.
Stookey, Lawrence L., to Hach Chemical Company. Ferroin reagent and method of making same. 3,770,735, Cl. 260-248.0as.
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Storey Brothers and Company, Limited: *See—*
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Stork Amsterdam N.V.: *See—*
Anselrode, Lodewijk, 3,770,534.
Koster, Wolfgang; and Jentzsch, Harald, 3,770,174.
Storz, Peter, to Bosch, Robert, G.m.b.H. D-C power supply system fed from an A-C generator. 3,771,045, Cl. 322-28.000.
Strabag Bau-AG: *See—*
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Straus, Herman A. Golf training and practice device. 3,770,280, Cl. 273-183.00b.
Strauss, Wolfgang: *See—*
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Stricon Products Limited: *See—*
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Strobel, Albert, to I-T-E Imperial Corporation. Interpole trip system for multi-pole circuit breaker. 3,771,081, Cl. 335-9.000.
Stromberg-Carlson Corporation: *See—*
Altenburger, Otto, 3,770,896.
Stroud, Lebern W.; and Everett, Jack E., 33 1/3% to Ralls, R. G. System for increasing the output of a multi-phase rectified rotary field system. 3,770,976, Cl. 307-10.00r.
Stuart, John J., Jr.: *See—*
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Stuber, Fred A.; and Ulrich, Henri, to Upjohn Company, The. Novel compositions. 3,770,846, Cl. 260-823.000.
Stull, John A., to Smyser, James A. Radially expansible tire supporting apparatus. 3,770,032, Cl. 144-288.00a.
Stumpf, Walter, to Simmons Company. Apparatus for manufacturing box springs. 3,770,180, Cl. 227-48.000.
Sturman, Geoffrey Wilfred; and Sinfield, Frederick, to International Computers Limited. Position sensing apparatus. 3,770,264, Cl. 270-79.000.
Sugaya, Yoshiharu: *See—*
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Sugihara, Yasaumasa, to General Corporation, The. Colour synchronizing system for a PAL colour television receiver. 3,770,883, Cl. 178-5.40p.
Sugimura, Nobuyuki. Valve assembly with linear motors. 3,770,018, Cl. 137-625.420.
Sulkowski, Theodore S.; and Mascitti, Albert A., to American Home Products Corporation. 2,(2-Amino-2,2-dialkylamino-3-hydroxy-3-phenyl-1H-benz[f] -isoindol-1-ones. 3,770,766, Cl. 260-325.000.
Sullivan, Alfred Bay: *See—*
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Sumikawa, Shozo; Mohri, Ikuji; and Miyaji, Masayuki, to Kyowa Hakko Kogyo Co., Ltd. Process for producing α-methyl glutamate. 3,770,807, Cl. 260-482.00p.
Sumitomo Chemical Co., Ltd.: *See—*
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Sunskes, Max. Adjustable window cleaning device for washing and drying both window surfaces from within the room. 3,769,651, Cl. 15-121.000.
Superior Electric Company, The: *See—*
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Swanson, Alfred B. Postoperative lumbrical bar and brace. 3,769,970, Cl. 128-77.000.
Swanson, Allen K., to Hamton Engineering Associates Inc. Projector slide advance timer. 3,770,979, Cl. 307-141.000.
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Swartwout, Richard J., to Dunham-Bush, Incorporated. Field installed low ambient damper for outdoor rooftop condenser installation. 3,769,810, Cl. 62-183.000.
Swartz, Horace M., to FMC Corporation. Switching apparatus. 3,769,915, Cl. 104-172.0bt.
Swearingen, Charles C.; and Sheptak, Nicolas, to Dow Chemical Company, The. Cable shielding tape. 3,770,570, Cl. 161-216.000.
SWF-Spezialfabrik fuer Autozubehoer Gustav Rau GmbH: *See—*
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Swinkels, Dominicus Adrianus Johannes; Scaife, Peter Hansen; and Lean, John Barry, to Broken Hill Proprietary Company, Limited, The. Processing of manganese ores. 3,770,868, Cl. 423-50.000.
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Sword, Gordon A. Dual axle convertible bike. 3,770,295, Cl. 280-229.000.
Sykes, Theodore J.; and Staron, Edward, to Interlake, Inc. Sealing mechanism. 3,769,859, Cl. 81-9.100.
Systems Enterprises Inc.: *See—*
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Szettler, Ernst; and Goebels, Siegmund E. Automatic film processing machine. 3,769,897, Cl. 95-94.00r.
Szymber, Oleg, to GAF Corporation. Video reproduction system for photographic and other images. 3,770,882, Cl. 178-5.20a.
Tabler, Donald C., to Phillips Petroleum Company. Catalyst and process for double bond isomerization. 3,770,660, Cl. 252-467.000.
Tabor, Edward J.; and French, Floyd R., to Dow Chemical Company, The. Method of inhibiting corrosion. 3,770,413, Cl. 71-116.000.
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Tada, Tetsuya. Single hand operated sprayer. 3,770,206, Cl. 239-349.000.
Taft, David D., to Ashland Oil, Inc. Curable epoxidized fatty compound/polyester coating composition. 3,770,675, Cl. 260-22.0ep.
Takahama, Sho, to Fuji Photo Film Co., Ltd. Magazine for an endless film. 3,770,223, Cl. 242-55.19a.
Takahashi, Mikio: *See—*
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Takahashi, Noriyuki; Inoue, Hidehiko; and Toshimitsu, Yoshihiko, to Honda Giken Kogyo Kabushiki Kaisha. Oil damper for vehicles. 3,770,258, Cl. 267-35.000.
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Tamura, Kohzoh; and Matsuno, Shigetoshi, to Kabushikikaisha Tokyo Keiki (Tokyo Keiki Co. Ltd.). Interface detector. 3,770,020, Cl. 137-802.000.
Tang, Arthur Y. C. Microwave oven apparatus. 3,770,930, Cl. 219-10.550.
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Tateno, Haruo; and Ichimiya, Torao, to Rikagaku Kinkyusho. Plasma Jet generator. 3,770,935, Cl. 219-121.00p.
Taub, William; and Avramoff, Moshe, to Yeda Research and Development Co., Ltd. 2-Substituted amino cycloalkylcarboxamides. 3,770,825, Cl. 260-557.00b.
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Terrones, Consuelo. Educational teaching board in four food groups. 3,769,720, Cl. 35-7.00a.
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Texas Iron Works, Inc.: *See—*
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Thebert, Glenn W., to General Motors Corporation. Gas turbine lubrication. 3,769,790, Cl. 60-39.080.

Thermark Corporation: *See—*
Dunning, Richard E., 3,770,479.

Theurer, Josef: *See—*
Plasser, Franz; and Theurer, Josef, 3,769,715.

Thibault, Jean-Jacques: *See—*
Boissin, Jean-Claude; and Thibault, Jean-Jacques, 3,769,806.

Thiele, Guenther, to Glasurit-Werke M. Winkelmann GmbH. Flexible laminated package. 3,770,122, Cl. 206-84.000.

Thiokol Chemical Corporation: *See—*
Paul, Henry N., III, 3,770,678.

Thomas, Albert J., Jr.: *See—*
Huskins, Chester W.; and Thomas, Albert J., Jr., 3,770,786.

Thomas, Michael D., to MCD Corporation. Contact lens holder. 3,770,113, Cl. 206-5.00a.

Thomas, Paul P., to Winzeler Stamping Company. Extensible table. 3,769,919, Cl. 108-83.000.

Thompson, George M.: *See—*
Thompson, William F.; and Thompson, George M., 3,770,013.

Thompson, John T.; and Gillemot, George W. Cable splice clamping and bonding assembly. 3,771,112, Cl. 339-244.00b.

Thompson, Robert M., to Sun Research and Development Co. Dialkyladamantane dinitrile. 3,770,794, Cl. 260-464.000.

Thompson, William F.; and Thompson, George M. Valve for use in dewatering system. 3,770,013, Cl. 137-606.000.

Thomson-CSF: *See—*
Kervizic, Jacques; Masic, Rene; and Warnecke, Robert Jean, 3,770,870.

Thon, Robert H., to Xerox Corporation. Magnetic retrieval device. 3,771,084, Cl. 335-285.000.

Thulin, Sigvard, to AGA Aktiebolag. Device for automatic sampling and measurement of liquid volumes. 3,769,841, Cl. 73-425.40p.

Tiemann, Jerome J.: *See—*
Engeler, William E.; and Tiemann, Jerome J., 3,770,988.

Tiemann, Theodor: *See—*
Greive, Aloys; and Tiemann, Theodor, 3,769,786.

Timken Company, The: *See—*
Knapp, Edward Ronald, 3,769,671.

Timmermans, Franz D. Method of making internally lined steel cylinders. 3,770,045, Cl. 164-118.000.

Tischer, Frederick J. Waveguide and circuit using the waveguide to interconnect the parts. 3,771,077, Cl. 333-95.00s.

Tixier, Michel, to Regie Nationale des Usines Renault. Electrolytic copper-plating solutions. 3,770,597, Cl. 204-52.00r.

Tjebben, John O., to Allis-Chalmers Corporation. Drawout switchgear assembly with suspended linear guide support means for movable contactor. 3,770,917, Cl. 200-50.0aa.

Toba, Teruo; and Umeda, Shozo, to Fujitsu Limited. Method for driving a plasma display panel. 3,771,016, Cl. 315-169.0tv.

Tokai Denka Kogyo Kabushiki Kaisha: *See—*
Fujimoto, Osamo, 3,770,530.

Tokico Ltd.: *See—*
Mihara, Kazuyasu, 3,770,198.

Tokyo Shibaura Electric Co., Ltd.: *See—*
Akiyama, Keiiti; and Makino, Kiyoji, 3,770,705.

Tolf, Ingvar L.; Herzing, Vernon J.; Miller, Everett L.; and Lightfoot, George L., to General Foods Corporation. Apparatus for inverting stacked units of sheet material. 3,770,141, Cl. 214-1.00q.

Tomic, Ernst A., to Du Pont de Nemours, E. I., and Company. Emulsion type explosive composite containing ammonium stearate or alkali metal stearate. 3,770,522, Cl. 149-2.000.

Tomita, Chuji; Miyazaki, Yuji; Kobayashi, Kazuo; and Okudaira, Mitsu, to Hitachi Roentgen Company, Limited. Tomographic apparatus. 3,770,955, Cl. 250-52.000.

Tomko, Lawrence Andrew: *See—*
Krupp, Roy Stephen; and Tomko, Lawrence Andrew, 3,770,895.

Tone Boring Company Limited: *See—*
Ikeda, Nobuhisa, 3,770,067.

Tonogai, Seinosuke: *See—*
Matsumoto, Akio; Tonogai, Seinosuke; and Morishita, Kosaku, 3,771,106.

Toolmasters Limited: *See—*
Hallewell, Raymond Thomas, 3,770,400.

Toray Industries, Inc.: *See—*
Funkumura, Takashi, 3,770,585.

Torelli, John A., to Du Pont de Nemours, E. I., and Company. Bis(3,4-dicarboxyphenyl)sulfone dianhydride metaphenylene diamine/oxydianiline polyimide precursor. 3,770,686, Cl. 260-30.200.

Toromanoff, Edmond: *See—*
Warnant, Julien; Farcilli, Andre; and Toromanoff, Edmond, 3,770,724.

Toschev, Mikhailovich: *See—*
Belenky, Alexandr Mikhailovich; Lazko, Viktor Evgenievich; Toschev, Mikhailovich; Bikmametov, Ilgiz Ganeevich; Vilkov, Vladimir Kirillovich; Mosendz, Nikolai Alexandrovich; Yakushina, Galina Mikhailovna; and Mikhailov, Mikhail Vasilievich Poplavko, 3,770,45.

Toshimitsu, Yoshihiko: *See—*
Takahashi, Noriyuki; Inoue, Hidehiko; and Toshimitsu, Yoshihiko, 3,770,258.

Townsend Engineering Company: *See—*
Greider, Charles Austin, 3,769,903.

Toy, Raymond M.: *See—*
Prodger, Brian S.; Parker, John C.; Bosley, Denis V.; and Toy, Raymond M., 3,769,746.

Toyoda Koki Kabushiki Kaisha: *See—*
Ohsima, Susumu, 3,769,761.

Tracked Hovercraft Limited: *See—*
Eastham, John Frederick; and Bolton, Hugh Robert, 3,770,995.

Trahanovsky, Walter; and Robbins, Dwight M., to Iowa State University Research Foundation, Inc. 1,2-Azidonitrates and method of producing same. 3,770,778, Cl. 260-349.000.

Transcale AB: *See—*
Ahl, Nils Goran, 3,770,068.

Transyt Corporation: *See—*
McRae, William V., Jr.; and Stuart, John J., Jr., 3,769,913.

Trasel, Johan; and Dupcak, Joseph D., to Lockheed Aircraft Corporation. Air inlet flap. 3,770,228, Cl. 244-53.00b.

Tri-Tech, Inc., mesne: *See—*
Haydon, Arthur W.; and Dean, John J., 3,770,998.

Triangle Mfg. Co., Inc.: *See—*
Schuette, Roland J., Jr., 3,769,660.

Troemel, Gerhard: *See—*
Witt, Harro; Troemel, Gerhard; and Berndt, Gerhard, 3,770,681.

Trofimenko, Swiatoslaw, to Du Pont de Nemours, E. I., and Company. Bis(dialkylaminomethyl)-phenylenedipalladium(11) compounds. 3,770,785, Cl. 260-429.00r.

Tromp, Hendrik Henricus Maria, to U.S. Philips Corporation. Storage configuration comprising shift registers. 3,771,140, Cl. 340-172.500.

Trowbridge, Charles A., to Sim-Kar Lighting Fixtures Co. Lighting fixture having fold-out lamp sockets. 3,770,952, Cl. 240-51.11r.

Troy Chemical Corporation: *See—*
Singer, William; and Driscoll, Alfred E., 3,770,684.

Trump, Dennis H., to Trump-Ross Industrial Controls, Inc. Shaft angle encoder. 3,770,970, Cl. 250-231.0se.

Trump-Ross Industrial Controls, Inc.: *See—*
Trump, Dennis H., 3,770,970.

TRW Inc.: *See—*
Kirkpatrick, Milton E; Piwonka, Thomas S.; and Marcus, Bruce D., 3,770,047.

Tsuji, Nobuo: *See—*
Kawano, Hideo; Kato, Hirotetu; and Tsuji, Nobuo, 3,770,450.

Tsukamoto, Kenkichi: *See—*
Fujii, Naoharu; Tsukamoto, Kenkichi; Yamamoto, Momi; and Iijima, Fumiko, 3,769,985.

Tsuruta, Hisao; and Kiyose, Norihiko, to Yanagimoto Seisakusho Co., Ltd. Photoelectric photometer. 3,770,354, Cl. 356-178.000.

Tucker, Don C., to ABC Dispersion Chemical Co. Phonograph record additive. 3,770,667, Cl. 260-22.0cb.

Tullos, Aubrey R. Pen tip construction forming secondary ink reservoir. 3,771,166, Cl. 346-140.000.

Turbo Power and Marines Systems, Inc., mesne: *See—*
Rostrom, Eric G., 3,769,795.

Turney, Larry, R., to Victor Equipment Company. Relief valve that seals against vacuum. 3,770,008, Cl. 137-516.250.

Tyler, William R.: *See—*
Hoy, Malcolm G.; and Tyler, William R., 3,770,393.

Tymann, Edward B.: *See—*
Huettner, Robert E.; Tymann, Edward B.; and Nolin, Richard, 3,771,134.
Huettner, Robert E.; and Tymann, Edward B., 3,771,135.

Uchida, Hiroyasu: *See—*
Kurimoto, Kozo; Watanabe, Sosuke; and Uchida, Hiroyasu, 3,771,165.

Uchida, Yosuke, to Fuji Photo Film Co., Ltd. Device for continuously mixing or reacting liquids. 3,770,250, Cl. 259-6.000.

Ueda, Takeshi: *See—*
Shichijo, Yoshihisa; Ichikawa, Yasushi; Sugaya, Yoshiharu; and Ueda, Takeshi, 3,770,494.

Uehara, Shiro: *See—*
Kinoshita, Koichi; Uehara, Shiro; Nagame, Hiroshi; and Yamada, Kazukiyo, 3,770,429.

Uehori, Tatsuo: *See—*
Imaoka, Yasuo; Tada, Takeo; Ishikawa, Takashi; and Uehori, Tatsuo, 3,770,500.

Ueki, Shiro; Fukada, Tadayuki; and Miyata, Yoshimitsu, to Kabushiki Kaisha Oji Yuka Goseishi Kenkyujo. Production of foamed heads. 3,770,663, Cl. 260-2.50b.

Ueki, Shiro; and Fukada, Tadayuki, to Kabushiki Kaisha Oji Yuka Goseishi Kenkyujo. Production of fine fibrous structures. 3,770,856, Cl. 264-13.000.

Uffner, Melville W.; and Holland, Dewey G., to Air Products and Chemicals, Inc. Functional surface coating compositions for cellulosic material. 3,770,685, Cl. 260-29.4ua.

Uhrich, Morris B., to FMC Corporation. Plow apparatus for vessel unloader. 3,770,145, Cl. 214-14.000.

Ulrich, Henri: *See—*
Stuber, Fred A.; and Ulrich, Henri, 3,770,846.

Umeda, Shozo: *See—*
Toba, Teruo; and Umeda, Shozo, 3,771,016.

Umemori, Takashi: *See—*
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Umrilov, Nikolai Fedorovich: *See—*

Kassir, Gennady Andreevich; Temnikov, Evgeny Markovich; Umrilov, Nikolai Fedorovich; Kurenkov, Ivan Ivanovich; Lukyanchikov, Vyacheslav Grigorievich; Guryanov, Viktor Artemievich; Ivashkin, Vasily Alexeevich; and Serov, German Vasilievich, 3,770,212.

Unfried, Happy H.: *See—*
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Union Carbide Corporation: *See—*
Collins, John J.; and Reber, Raymond A., 3,770,621.
Cotter, George H.; and Hanes, William C., 3,770,932.
Koleske, Joseph Victor; Lundberg, Robert Dean; Pollart, Dale Flavian; and Smarook, Walter Henry, 3,770,564.
Kupcikevicius, Vytautas, 3,770,134.
Matzner, Markus; McGrath, James E.; and Noshay, Allen, 3,770,849.

Union Special Maschinenfabrik G.m.b.H.: *See—*
Von Hagen, Wolf-Rudiger, 3,769,925.

United Merchants and Manufacturers, Inc.: *See—*
Richardson, Byron L., 3,770,489.

United Nuclear Corporation: *See—*
Rogell, Martin L., 3,770,582.

United States of America
Agriculture: *See—*
Finley, John W., 3,770,452.
Luvisi, Fred P.; Filachione, Edward M.; and Hopkins, William J., 3,770,372.
Air Force: *See—*
Brabson, George Dana, Jr.; King, Lowell A.; Seegmiller, David W.; and Fannin, Armand A., Jr., 3,770,503.
Ekland, Phillip R., 3,769,672.
Gaudio, Joseph G., 3,771,070.
Pepper, Roger T.; and Kendall, Ernest G., 3,770,488.
Slobodnik, Andrew J., Jr., 3,771,072.
Stevens, Emerson W., 3,769,797.
Von Ohain, Hans J. P.; and Scolatti, Charles A., 3,770,227.
Army: *See—*
Bobinski, Jack; and Picard, Jean P., 3,770,563.
Burnett, Jimmy D., 3,770,787.
Huskins, Chester W.; and Thomas, Albert J., Jr., 3,770,786.
Sayles, David C., 3,770,526.
Smith, James R., 3,770,380.
Army, mesne: *See—*
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Robbins, Robert; and Boswell, Benjamin C., Jr., 3,770,721.
Atomic Energy Commission: *See—*
Folkins, Glenn O., 3,769,911.
Health, Education and Welfare: *See—*
Williams, David L., 3,770,607.
Health, Education and Welfare, mesne: *See—*
Robinson, Thomas C., 3,769,960.
National Aeronatuics and Space Administration; Administrator; with respect to an invention of:
Yun-Minga, Sam; and Wilson, Thomas G. Regulated DC-to-DC converter for voltage step-up or step-down with input-output isolation. 3,771,040, Cl. 321-2.000.
National Aeronautics and Space Administration: *See—*
Bailey, Charles L., Jr., 3,771,037.
Garner, Howell D.; and Hellbaum, Richard F., 3,770,021.
Holko, Kenneth H.; and Moore, Thomas J., 3,770,933.
Little, Robert E., 3,769,689.
National Aeronautics and Space Administration; Administrator; with respect to an invention of:
Billingsley, Frederic C. Image data rate converter having a drum with a fixed head and a rotatable head. 3,770,903, Cl. 179-100.2md.
Ogle, John S. Whole body measurement systems. 3,769,834, Cl. 73-149.000.
Vessot, Robert F. C.; Hoffman, Thomas E.; and Levine, Martin W. Tunable cavity resonator with ramp shaped supports. 3,771,074, Cl. 333-83.00r.
Navy: *See—*
Brown, Charles H.; and Miller, Frederic L., 3,770,353.
Curran, William J.; and Kulik, John J., 3,770,884.
Curran, William J.; and Kulik, John J., 3,770,885.
Goldberg, Lawrence S.; and Schnur, Joel M., 3,771,065.
Haas, Charles B.; Taylor, Richard E.; Crockett, David E.; Miller, James F.; Paul, Howard R.; and Reid, Charles J., 3,769,876.
Ordway, Donald E.; and Hale, Richard W., 3,769,833.
Schoolar, Richard B.; Lequin, Doris S.; Mathews, Harry E., Jr.; and Culpepper, Ronald N., 3,770,565.
Skoures, Alexander E., 3,769,844.
Van Buskirk, Lyman F., 3,770,887.
Whitehouse, Harper John; and Speiser, Jeffrey M., 3,770,949.
Winslow, Lester M., 3,771,010.

United States Steel Corporation: *See—*
Abarotin, Eugene V.; and Bollinger, Edward R., Jr., 3,769,704.

Unitika Kabushiki Kaisha: *See—*
Kobayashi, Humio; Sakata, Hiroshi; Mizoguti, Takesi; Kagakii, Akio; and Naramura, Isuyoshi, 3,770,736.

University Creatons, Inc.: *See—*
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University of Illinois Foundation: *See—*
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Uno, Naoyuki; Nomura, Katsuhiko; Sakazaki, Tadazumi; Watanabe, Koichiro; Miyata, Katsuhiko; and Urano, Fumio, to Asahi Kogaku Kogyo Kabushiki Kaisha. Shutter operating mechanism having an automatic exposure time control means for photographic camera. 3,769886, Cl. 95-10.00c.

Upjohn Company, The: *See—*
Bundy, Gordon L., 3,770,788.
Kelly, Robert C., 3,770,777.
Kominek, Leo A., 3,770,586.
Rynbrandt, Ronald H., 3,770,747.
Stuber, Fred A.; and Ulrich, Henri, 3,770,846.

Upton Industries, Inc.: *See—*
Kemper, Eugene L., 3,770,501.

Urano, Fumio: *See—*
Uno, Naoyuki; Nomura, Katsuhiko; Sakazaki, Tadazumi; Watanabe, Koichiro; Miyata, Katsuhiko; and Urano, Fumio, 3,769,886.

Urban, Michael J.: *See—*
Cohen, Leonard D.; Shortt, Brian A.; and Urban, Michael J., 3,771,044.

Uroshevich, Miroslav, to Murdock Inc. Frostproof hydrant. 3,770,003, Cl. 137-281.000.

U.S. Philips Corporation: *See—*
Geominy, Louis Joseph Henri, 3,769,703.
Hoek, Serge; and Buhren, Wilhelm, 3,770,199.
Jager, Lothar, 3,770,283.
Maan, Cornelis; Collaris, Maria Antonius Alphonsus Andreas; and Coenen, Renier Gertruda Hubertus, 3,770,601.
Tromp, Hendrik Henricus Maria, 3,771,140.
Zwicker, Walter K., 3,770,533.

U.S. Terminals, Inc.: *See—*
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USM Corporation: *See—*
Imhof, Herman A., 3,769,649.
Meyer, Engelbert A., 3,769,662.

Vaillant, Joh., KG: *See—*
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Meier, Hans, 3,770,197.

Valyi, Zoltan: *See—*
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Vamos, Gyorgy: *See—*
Kapolyi, Laszlo; Lazar, Ferenc; Vamos, Gyorgy; and Galauner, Bela, 3,770,469.

Van Buskirk, Lyman F., to United States of America, Navy. Color stereo television. 3,770,887, Cl. 178-6.500.

Van der Loos, Josef L. M.; and Claassen, Peter J. M. W., to Stamicarbon N.V. Process for the anionic catalytic polymerization of lactams. 3,770,689, Cl. 260-332.00r.

Van Gheluwe, Joris E. A.: *See—*
Dadic, Miroslav; Van Gheluwe, Joris E. A.; and Valyi, Zoltan, 3,770,453.

Van Gheluwe, Joris E. A.; and Dadic, Miroslav, to Molson Industries, Limited. Production of carbonated beverages. 3,770,455, Cl. 426-477.000.

Van Gompel, James J., to Brammall, Inc. Cable lock and seal device. 3,770,307, Cl. 292-307.00r.

Van Heddegen, Luciaan H. E., to International Standard Electric Corporation. Character recognition device. 3,771,127, Cl. 340-146.30j.

Van Horn, John W.: *See—*
Fayling, Clarence D.; Van Horn, John W.; and Ray, Philip M., 3,770,090.

van Landeghem, Hugo: *See—*
Derrien, Michel; van Landeghem, Hugo; JeanJean, Pierre; and Le Page, Jean Francois, 3,770,619.

Vandenberg, Edwin J., to Hercules Incorporated. Ammonia or amine modified organomagnesium catalyst compositions. 3,770,655, Cl. 252-431.00n.

Vandervelden, Cornelius Keith; and Leiono, Robert, to Litton Medical Products, Inc. Dental X-ray monitoring system. 3,770,963, Cl. 250-409.000.

Vanyi, Louis. Heat control for heated tool. 3,770,183, Cl. 228-53.000.

Varian Associates: *See—*
Anderson, Weston A., 3,771,055.
Hyde, James S., 3,771,054.
Rosztoczy, Ferenc E.; Casau, Celestin J.; and Kinoshita, Joshyo, 3,770,518.

Varner, George C.: *See—*
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Varta Aktiengesellschaft: *See—*
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VCA Corporation: *See—*
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Sagarin, Philip H., 3,770,168.
Steman, Wolf; and Henes, Steven W., 3,770,165.

Veber, Daniel F.: *See—*
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Veglia, Bartolomeo, to Riv-SKF Officine di Villar Perosa S.p.A. Bearing having closure means for closing the bearing seating. 3,770,992, Cl. 308-187.200.

Vegners, Edgar Z., to Eaton Corporation. Free wheeling 2-speed motor wheel. 3,770,075, Cl. 180-66.00f.
Veltkamp, Clarence W. Water sweep. 3,770,210, Cl. 239-532.000.
Vendo Company, The: *See—*
O'Neal, Wilbert O., 3,770,105.
Vepa AG: *See—*
Fleissner, Heinz, 3,770,374.
Vera Fabrikker A/S: *See—*
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Verduin, Lee V.; and Rosenhagen, William, to Rowe International, Inc. Lottery ticket merchandiser. 3,770,089, Cl. 194-1.00n.
Vereinigte Aluminium-Werke Aktiengesellschaft: *See—*
Sautter, Werner; and Gilak, Ahmad, 3,770,600.
Veselova, Olga Vladimirovna: *See—*
Kovalkov, Gely Alexeevich; and Veselova, Olga Vladimirovna, 3,770,999.
Vessot, Robert F. C.: *See—*
United States of America, National Aeronautics and Space Administration, 3,771,074.
Victor Equipment Company: *See—*
Miller, Richard, 3,770,009.
Turney, Larry, R., 3,770,008.
Victory, Ebrahim, to Pulsation Corporation. Irrigation apparatus. 3,769,976, Cl. 128-229.000.
Victory, Ebrahim, to Pulsation Corporation. Hygienic irrigator. 3,769,977, Cl. 128-229.000.
Viellevoyl, Lucien Nicolas Leon: *See—*
Kobus, Stanislas; Kruithof, Albert; and Viellevoyl, Lucien Nicolas Leon, 3,770,899.
Vilkov, Vladimir Kirillovich: *See—*
Belenky, Alexandr Mikhailovich; Lazko, Viktor Evgenievich; Toschev, Mikhailovich; Bikmametov, Ilgiz Ganeevich; Vilkov, Vladimir Kirillovich; Mosendz, Nikolai Alexandrovich; Yakushina, Galina Mikhailovna; and Mikhailov, Mikhail Vasilievich Poplavko, 3,770,45.
Villasenor, Antonio: *See—*
Celada, Juan; Mackay, Patrick W.; Garcia, Gilberto Guerra; Martinez, Enrique R.; and Villasenor, Antonio, 3,770,421.
Villey-Desmeserets, F.; and Guillauma, Germain, to Etat Francais, Delegation Ministerielle pour l'Armement. High luminosity infrared pyrotechnical composition. 3,770,525, Cl. 149-19.300.
Vischer Products Company: *See—*
Kozinczuk, Orest A., 3,769,958.
Vitzthum, Otto: *See—*
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Vogt, Hans Josef, to Girling Limited. Hydraulic braking systems for vehicles. 3,770,326, Cl. 303-6.00c.
Voigt, Donald B.: *See—*
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Vojkovic, Milos: *See—*
Lake, James L.; Litz, John E.; Coleman, Robert B.; Goldenberg, Marcel; and Vojkovic, Milos, 3,770,414.
Volkert, Otto; and Zuerger, Manfred, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of gravure printing plates based on plastics materials. 3,770,435, Cl. 96-45.000.
Volkswagenwerk Aktiengesellschaft: *See—*
Spengler, Erich; and Requardt, Heiko, 3,771,047.
Von Almasy, Heinz: *See—*
Huttinger, Wilhelm; Von Almasy, Heinz; and Buchwald, Joachim, 3,770,644.
Von Friedrich, Adolf: *See—*
Scherhag, Bernhard; Wolz, Hermann; and Von Friedrich, Adolf, 3,770,759.
Von Hagen, Wolf-Rudiger, to Union Special Maschinenfabrik G.m.b.H. Loop taker lubrication for sewing machines. 3,769,925, Cl. 112-256.000.
Von Konig, Anita: *See—*
Poot, Albert Lucien; Heugebaert, Clement; Brinckman, Eric Maria; Von Konig, Anita; and Kampfer, Helmut, 3,770,448.
Von Ohain, Hans J. P.; and Scolatti, Charles A., to United States of America, Air Force. Jet wing with multiple thrust augmentors. 3,770,227, Cl. 244-42.0cc.
Voss, Peter: *See—*
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Vroman Foods, Inc.: *See—*
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Vroman, Robert H., to Vroman Foods, Inc. Method of producing a molded frozen body. 3,770,460, Cl. 426-279.000.
Waaben, Sigurd Gunther: *See—*
Boll, Harry Joseph; Heightley, John Donnell; Koo, James Teh-Zen; Lynch, William Thomas; Nelson, James Thomas; Bard, Richard; Waaben, Sigurd Gunther; and Waggener, Herbert Atkin, 3,771,147.
Wada, Hisayuki: *See—*
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Waggener, Herbert Atkin: *See—*
Boll, Harry Joseph; Heightley, John Donnell; Koo, James Teh-Zen; Lynch, William Thomas; Nelson, James Thomas; Bard, Richard; Waaben, Sigurd Gunther; and Waggener, Herbert Atkin, 3,771,147.
Wagner Electric Corporation: *See—*
Hardwick, David R.; and Stelzer, Raymond F., 3,769,997.
Stelzer, Raymond F., 3,770,019.
Wagner, Kuno; and Hajek, Manfred, to Bayer Aktiengesellschaft. Acyclic nitriles. 3,770,799, Cl. 260-465.50r.
Wagreich, Murray M. Vacuumatic clamp. 3,770,259, Cl. 269-21.000.
Wahlig, Helmut: *See—*
Gams, Erwin; Namenyi, Istvan; Wahlig, Helmut; Erdmann, Dietrich; and Koch, Wolfgang, 3,770,817.
Wais, Lowell; and Milbourne, Charles C., to Harnex, Inc. Restraining and training harnessing device. 3,769,939, Cl. 119-106.000.
Walbridge, Lyman H., to Kidde, Walter, & Company, Inc. Burner sequence programmer. 3,770,364, Cl. 431-78.000.
Walburn, Richard H. Tape recorder with automatic program selector. 3,770,281, Cl. 274-4.00d.
Waldvogel, Erwin: *See—*
Bourquin, Jean-Pierre; Schwarb, Gustav; and Waldvogel, Erwin, 3,770,728.
Walker, Charles G.: *See—*
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Walker, David Albert: *See—*
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Walker, Robert M.: *See—*
Fleischer, Robert L.; and Walker, Robert M., 3,770,962.
Walker, Robert W.; and Gehlhaus, Paul H., to Rohm & Haas Company. Composite propellants containing polymers of trinitratopentaerythrityl acrylate. 3,770,524, Cl. 149-19.500.
Wallace, David J.: *See—*
Weaver, Max A.; and Wallace, David J., 3,770,370.
Wallace, William P.: *See—*
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Walles, Wilhelm E., to Dow Chemical Company. Surface sulfonation-epoxidation of organic polymers. 3,770,706, Cl. 260-79.30r.
Wallestad, Victor C., to Fluoroware, Inc. Spray processing machine. 3,769,992, Cl. 134-144.000.
Wallis, Craig; and Melnick, Joseph L., to Carborundum Company, The. Removal of virus from fluids. 3,770,625, Cl. 210-36.000.
Wallskog, Alan G., to Teletype Corporation. Linear electric motor and displacement process. 3,771,034, Cl. 318-135.000.
Walrafen, George Edouard: *See—*
Stone, Julian; and Walrafen, George Edouard, 3,770,350.
Walter, Lewis A., to Schering Corporation. Pyrazine derivatives. 3,770,737, Cl. 260-250.00r.
Walter, Vincent J. Video and audio passing and lane changing signaling system for vehicles. 3,771,096, Cl. 339-3.000.
Walton Products, Inc.: *See—*
Reed, Robert T., 3,771,110.
Wanner, Vernon W., to Allen-Bradley Company. Selector switch actuator with part of detent means integral with actuator cam. 3,770,926, Cl. 200-166.0sd.
Ward, Peter Thomas: *See—*
Merchant, Thomas Harry; Ward, Peter Thomas; and Terence, Richard, 3,770,309.
Ward, Peter Thomas; Smith, Richard Terece; and Siverns, Donald, to Rubery, Owen & Co., Limited. Hydraulic systems. 3,770,076, Cl. 180-66.00r.
Ware, Richard E.; and Hall, Lewis W., Jr., to Sun Research and Development Co. Upgrading agricultural spray oil. 3,770,620, Cl. 208-297.00r.
Warman, Blair H. Patient transfer method and apparatus. 3,769,642, Cl. 5-81.00a.
Warnant, Julien; Farcilli, Andre; and Toromanoff, Edmond, to Roussel-UCLAF. Process for preparing pentacyclic alkaloids. 3,770,724, Cl. 260-239.30p.
Warnecke, Robert Jean: *See—*
Kervizic, Jacques; Masic, Rene; and Warnecke, Robert Jean, 3,770,870.
Warwick Electronics, Inc.: *See—*
Ryan, Allen L., 3,770,282.
Warwick, William Gill: *See—*
Langley, Robert; Richards, Ronald Francis John; and Warwick, William Gill, 3,770,474.
Wasielewski, Leonard: *See—*
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Watanabe, Sosuke: *See—*
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Watarai, Syu; and Ono, Hisatake, to Xerox Corporation. Photoconductive reaction product of N-beta-chlorethyl carbazole and formaldehyde. 3,770,428, Cl. 96-1.500.
Watson, Thomas A. W. K. Rotary mechanical translating device. 3,770,879, Cl. 74-682.000.
Watts, Eugene R. V.; and Marcotte, Alfred J., Jr., to Sanders Associates, Inc. Communication apparatus. 3,771,156, Cl. 340-325.000.
Waymouth, John F.: *See—*

Roche, William J.; and Waymouth, John F., 3,771,013.
Weaver, Max A.; and Wallace, David J., to Eastman Kodak Company. Polyamide fibers dyed with a thiadiazolyl azo compound. 3,770,370, Cl. 8-41.00b.
Webb, Jeris B., Company: *See*—
McCaul, Edward W., 3,770,100.
Weber, Jonathan T.; Brofft, B. Warren; and Coyne, Hugh J., to Positrol, Inc. Hydraulically controlled holding device. 3,770,287, Cl. 279-2.000.
Weber, Reinold. Combination desk and chair. 3,770,334, Cl. 312-223.000.
Webster, Harold F., to General Electric Company. X-ray display panel. 3,770,960, Cl. 250-460.000.
Webster, Owen Wright, to Du Pont de Nemours, E. I., and Company. 2-Substituted -4,5-dicyanoimidazoles. 3,770,764, Cl. 260-309.000.
Wechsler, Robert M. Three dimensional image reproduction with pseudo-scopy correction by image inversion optics which are capable of independently controlling Z-axis placement in image space. 3,769,889, Cl. 95-18.00p.
Wedemeyer, Karlfried: *See*—
Pelz, Willibald; Credner, Hans-Heinrich; Schulte, Walter; Klein, Alfons; Wedemeyer, Karlfried; and Nittel, Fritz, 3,770,445.
Wefer, Kurt, to Strabag Bau-AG. Walking lift barge. 3,769,802, Cl. 61-46.500.
Wehr, Robert L.; Rearick, Edward W., Jr.; and Mc Bride, Lemuel R., to Billco Manufacturing Inc. Handling sheet material. 3,770,266, Cl. 271-97.000.
Weichselbaum, Theodore E., to Sherwood Medical Industries, Inc. Histological slide. 3,770,477, Cl. 117-3.000.
Weidinger, Kurt: *See*—
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Weiss, Samuel Herman. Folding table leg locking device. 3,769,920, Cl. 108-133.000.
Weissman, Eugene Yehuda; McDonald, Guy Douglas; and Weinlein, Conrad Eugene, to Globe-Union, Inc. Electrochemical battery employing bonded lead dioxide electrode and fluoroboric acid electrolyte. 3,770,507, Cl. 136-26.000.
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Werkman, Robert T.: *See*—
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West Laboratories, Inc.: *See*—
Cantor, Abraham; and Winicov, Murray W., 3,770,641.
Westell, William E., to Baird-Atomic Inc. Liquid crystal imaging system. 3,770,961, Cl. 250-331.000.
Western Electric Company, Incorporated: *See*—
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Westinghouse Air Brake Company: *See*—
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Westinghouse Corporation: *See*—
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Westinghouse Electric Corporation: *See*—
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Whateley, Eric Albert, to Brown, David, Industries, Limited. Change-speed gearing. 3,769,857, Cl. 74-730.000.
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Janke, Donald E.; Marcade, Roque D.; and Karklys, Joseph, 3,769,716.
Robinson, James M.; and Lyman, John B., 3,769,809.
White, Dwain M. Bis (polyphenylene ether)-sulfone block copolymers. 3,770,699, Cl. 260-49.000.
White, Dwain M., to General Electric Company. Bis(polyphenylene oxide)-urethane block copolymers. 3,770,850, Cl. 260-858.000.
White, Ellis R., to Shell Oil Company. 4,4,4-Trinitrobutyl cyanoacetate. 3,770,795, Cl. 260-465.400.
White, Eugene B., to Filters International, Inc. Cartridge-type filter element and housing therefor. 3,770,127, Cl. 210-136.000.
White, Jerry L.: *See*—
Hableb, Karlem A.; and White, Jerry L., 3,770,557.
White, Matthew B., to Philco-Ford Corporation. Totally reflecting laser refractometer. 3,770,352, Cl. 356-133.000.
Whitehouse, Harper John; and Speiser, Jeffrey M., to United States of America, Navy. Acoustic surface wave correlators and convolvers. 3,770,949, Cl. 235-181.000.
Whitney, Thomas A.: *See*—
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Whittaker, Henry C. Anti-pollution exhaust system for an internal combustion engine. 3,769,798, Cl. 60-279.000.
Wiechert, Rudolf: *See*—
Hofmeister, Helmut; Laurent, Henry; Prezewowsky, Klaus; Wiechert, Rudolf; and Steinbeck, Hermann, 3,770,726.
Wiedmann, Siegfried K., to International Business Machines Corporation. Isolation diffusion method for making reduced beta transistor or diodes. 3,770,519, Cl. 148-175.000.
Wiegand, Karl E.: *See*—
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Wiener, Patricia P. Addressing an integrated circuit read-only memory. 3,771,145, Cl. 340-173.00r.
Wiggerman, Roger A.: *See*—
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Wilbert, Michael E.: *See*—
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Wilbrecht, Lester L. Snap-action switch. 3,770,921, Cl. 200-68.000.
Wilcox, Richard L., to Delavan Manufacturing Company. Aspirating spray head. 3,770,209, Cl. 239-434.000.
Wild, Albrecht: *See*—
Borck, Joachim; Dahm, Johann; Hovy, Jan Willem; Kramer, Josef; and Wild, Albrecht, 3,770,748.
Wilde, Thomas J. Method of melting iron with lumps of carbon coke. 3,770,418, Cl. 75-43.000.
Will, Gareth W.: *See*—
Evans, Joseph H.; and Will, Gareth W., 3,770,556.
William, John, to International Telephone and Telegraph Corporation. Connector housing removal tool. 3,769,680, Cl. 29-203.00h.
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Williams, Darrell Andrew; and Wisinski, Adam Prus, to ICI Australia, Limited. Method of pumping explosive slurry. 3,769,874, Cl. 86-20.00c.
Williams, David L., to United States of America, Health, Education and Welfare. Glucose determination apparatus. 3,770,607, Cl. 204-195.00p.
Williams Harvey Research Corporation: *See*—
Brumfield, Robert C.; and Simmons, Edward E., 3,770,129.
Williams, Hugh Charles, to Imperial Tobacco Group Limited. Apparatus for treating a fleece of fibrous material. 3,769,990, Cl. 131-81.000.
Williams, James Jeffrey Llewelyn: *See*—
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Willow Hill Industries Inc.: *See*—
Puzik, Otto V., 3,769,691.
Willutzki, Kort. Vacuum tube for accelerating charged particles, such as electrons or ions, by high electric direct voltages. 3,771,000, Cl. 313-63.000.
Wilson, Charles R.: *See*—
Shaffer, Thomas N.; Wilson, Charles R.; and Wright, Lawrence G., 3,771,117.
Wilson, Frank H. Power plant. 3,769,793, Cl. 60-39.16r.
Wilson, Thomas G.: *See*—
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Winkelmann, Herbert E., to General Motors Corporation. Clearance take up bearing assembly. 3,770,990, Cl. 308-72.000.
Winkler, John A., to Lee, Raymond, Organization, Inc., The. Fishing equipment retriever. 3,769,734, Cl. 43-17.200.
Winkler, Richard H., to Spectrotherm Corporation. Electronic switch for an operational amplifier circuit. 3,770,890, Cl. 178-7.600.
Winnie, Alon P.: *See*—
Nimoy, Melvin; and Winnie, Alon P., 3,769,975.
Winslow, Lester M., to United States of America, Navy. Liquid cooled band edge oscillation prevention for a TWT. 3,771,010, Cl. 315-3.500.
Winter, Hermann: *See*—
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Winter, Joseph: *See*—
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Winter, Sigbert, to Bosch, Robert, G.m.b.H. Hydraulic system. 3,769,800, Cl. 60-445.000.

Winterbottom, David A.; Wheadon, Ellis G.; and Higdon, Philip E., to General Motors Corporation. Storage battery having integral cables extending the battery's terminals. 3,770,511, Cl. 136-135.00s.

Winzeler Stamping Company: *See—*
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Wirbser, Oskar: *See—*
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Witco Chemical Company, Inc.: *See—*
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Witt, Harro; Troemel, Gerhard; and Berndt, Gerhard, to Bayer Aktiengesellschaft. Fibrous polyurethane dispersions by chain extension of polycarbonate based prepolymer with aqueous polyamine. 3,770,681, Cl. 260-29.2tn.

Witt, William F., to Avco Corporation, mesne. Interlock system for tape transport. 3,770,902, Cl. 179-100.2za.

Witten, Louis: *See—*
Haycock, John Norman; and Witten, Louis, 3,770,527.

Wittke, Paul, to Condux-Werke-Herbert A. Merges K.G. Comminuting device. 3,770,215, Cl. 241-77.000.

Wolfe, Merritt W., to Goodyear Tire & Rubber Company, The. Relugging large pneumatic tires. 3,770,038, Cl. 152-209.000.

Wolz, Hermann: *See—*
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Wood, Bernard J., to Stanford Research Institute. Catalytic conversion of alkanonitriles and alkenonitriles to a preselected alkenonitrile isomer. 3,770,797, Cl. 260-469.900.

Woodward, John W., to GTE Automatic Electric Laboratories, Incorporated. Called line status testing circuit. 3,770,898, Cl. 179-18.0ab.

Woody, Albert L.: *See—*
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Wright, Andrew Charles Walden: *See—*
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Wright, Clarence. Vehicle cooling system. 3,770,049, Cl. 165-41.000.

Wright, Lawrence G.: *See—*
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Wright, Maurice E. Relocatable building structure. 3,769,765, Cl. 52-69.000.

Wright Rain Limited: *See—*
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Wuhrer, Josef; Kurczyk, Heinz Georg; and Ottenheym, Adrian, to Rheinische Kalksteinwerke GmbH. Process for producing hydrates of calcium-magnesium silicates. 3,770,475, Cl. 106-306.000.

Wyatt, Philip J., to Science Spectrum, Inc. Optical analyzer for microparticles. 3,770,351, Cl. 356-102.000.

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Wycoff, Keith H. Tone operated single side band communication system. 3,771,060, Cl. 325-50.000.

Wystrach, Vernon Paul, to American Cyanamid Company. Chemical treatment of metal. 3,770,513, Cl. 148-6.15r.

Wystrach, Vernon Paul, to American Cyanamid Company. Chemical treatment of metal. 3,770,514, Cl. 148-6.15r.

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Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Horohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isamu; Mori, Minno Kazuo; and Kobayashi, Tsoyoshi, to Sumitomo Chemical Company, Ltd. 2-Aminomethylindole derivatives. 3,770,767, Cl. 20-326.150.

Yamamoto, Jiro; Minakawa, Kazuo; Nishikado, Hideki; and Imon, Shintaro, to Nippon Oil Company, Limited. Method of treating oil-containing contaminated drainage. 3,770,628, Cl. 210-40.000.

Yamamoto, Masao: *See—*
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Yamamoto, Michihiro: *See—*
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Yamazaki, Eiichi; and Kawamura, Takao, to Hitachi, Ltd. Adapters for the terminal pins of electron tubes. 3,771,105, Cl. 339-36.000.

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Yanagimoto Seisakusho Co., Ltd.: *See—*
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Yanamoto, Hisao; and Nakao, Masaru, to Sumitomo Chemical Company, Ltd. Process for producing ni-acylated phenylhydrazone compounds. 3,770,752, Cl. 260-295.50h.

Yarber, Gordon W. Brake control system with flow control. 3,770,328, Cl. 303-21.00f.

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Yoneya, Juho: *See—*
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Yoritomi, Ryutaro. Continuous press for dehydration. 3,769,904, Cl. 100-158.00c.

Yoshitomi Pharmaceutical Industries, Ltd.: *See—*
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Yoshizawa, Atsushi; and Kitazawa, Takaji, to Nihon Rika Seishi Kabushiki Kaisha. Paste for gummed tape and process for producing the same from hydrolyzed starch. 3,770,672, Cl. 260-17.4st.

Yoshizawa, Keiichi: *See—*
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Youdin, Myron; Barker, June N.; and Reich, Theobald, to New York University. Apparatus for determining local cerebral blood flow. 3,769,966, Cl. 128-2.05f.

Young, Arthur W. Tillage implement. 3,770,066, Cl. 172-194.000.

Young, Ernest L. Mobile home holdown apparatus. 3,769,764, Cl. 52-23.000.

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Yun-Minga, Sam: *See—*
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Yungkurth, Donald G.; and McSweeney, Gary J., to Eastman Kodak Company. Photographic composition of 1,1-bis-sulfonyl alkane and hydroxylamine. 3,770,432, Cl. 96-29.00r.

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Zelinski, Robert P.; Short, James N.; Gath, Rudolph H.; and Zuech, Ernest A., to Phillips Petroleum Company. Olefin polymerization. 3,770,713, Cl. 260-93.700.

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Zenith Radio Corporation: *See—*
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Zenz, Frederick A. Granular bed filter reactor. 3,770,388, Cl. 23-284.000.

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Zernov, Peter; and Gabel, Thomas H., to Zerand Corporation. Reverse nested blank stacker. 3,770,142, Cl. 214-6.00h.

Zimmerman, Henry A., to Tektronix, Inc. Display baseline stabilization circuit. 3,771,056, Cl. 324-57.00r.

Zimmermann & Jansen Gesellschaft mit beschrankter Haftung: *See—*
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Zuerger, Manfred: *See*—
Volkert, Otto; and Zuerger, Manfred, 3,770,435.

Zulaski, John A., to S & C Electric Co. System for powering a combination of variable burden and fixed burden voltage dependent loads from a high impedance source. 3,771,043, Cl. 320-39.000.

Zwicker, Walter K., to U.S. Philips Corporation. Method of producing high resolution patterns in single crystals. 3,770,533, Cl. 156-17.000.

LIST OF PLANT PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 6TH DAY OF NOVEMBER, 1973

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Duffett, William E.: *See*—
Jessel, Walter H., Jr., and Duffett. 3,405.
Gortz, Helmut K., to Yoder Brothers, Inc. Chrysanthemum plant. 3,404, 11–6–73; Cl. 74.
Jessel, Walter H., Jr., and W. E. Duffett, to Yoder Brothers, Inc. Chrysanthemum plant. 3,405, 11–6–73, Cl. 78.
Thomson, William P. Carnation plant. 3,406, 11–6–73. Cl. 71.
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Jessel, Walter H., Jr., and Duffett. 3,405.

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AMP Inc.: *See*—
Kourimsky, Friedrich J. A. 229,062.
Adachi, Masatoshi: *See*—
Wakai, Noboru, and Adachi. 229,107.
Adler, James S.: *See*—
Dolby, John T., and Adler. 229,009.
Air King Corp.: *See*—
Swimmer, James A. 229,059.
All-Steel Equipment Inc.: *See*—
Powell, James C. 229,064.
Allen, Francis D.: *See*—
Freedman, Alan L., and Allen. 229,022.
Alms, Erhard E., and J. E. Mitchell, to AFE Industries, Inc. Space heater. 229,058, 11–6–73, Cl. D23—91.
Amerock Corp.: *See*—
Clayton, LaVerne E. 229,027.
Anderson, Eldon L., Jr., to General Electric Co. Liminaire. 229,090, 11–6–73, Cl. D48—23.
Andrus, Edward R., Jr., D. E. Fahnstrom, and J. G. Hansen, to Elder Wilbert Corp. Casket. 229,050, 11–6–73, Cl. D19—1.
Antoine, Harold, Jr. Pendant. 229,088, 11–6–73, Cl. D45—15.
Asta-Werke Aktiengesellschaft, Chemische Fabrik of Brackwede: *See*—
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Aster, Harold, Ball whirling toy. 299,078, 11–6–73, Cl. D34—15.
Automatic Radio Mfg. Co., Inc.: *See*—
Lyall, George E. 229,070.
Avery Laboratories Inc.: *See*—
Avery, Roger E. 229,111.
Avery, Roger E., to Avery Laboratories Inc. Neurostimulation transmitter or the like. 229,111, 11–6–73, Cl. D83—1.
Baker, Kenneth R., R. Plescia, and G. C. Ferguson, to Saul Davidson. Boat upper shell. 229,103, 11–6–73, Cl. D71—1.
Baker, Kenneth R., R. E. Plescia, and G. C. Ferguson, to Saul Davidson. Boat upper shell. 229,104, 11–6–73, Cl. D71—1.
Bateman, Robert F., to Plastics, Inc. Tumbler. 229,008, 11–6–73, Cl. D7—14.
Bauer Bros. Co., The: *See*—
Ginaven, Marvin E. 229,055.
Bell, Jess A., to Eyelet Specialty Co. Combined lipstick and lip gloss pot. 229,120, 11–6–73, Cl. D86—10.
Bellamy, Janett N. Ring. 229,086, 11–6–73, Cl. D45—10.
Benty, John L., D. Depano, and R. I. Kallman, to Clairol Inc. Make-up mirror. 229,121, 11–6–73, Cl. D86—10.
Bergman Tool Mfg. Co., Inc.: *See*—
Freedman, Alan L., and Allen. 229,022.
Berkline Corp., The: *See*—
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Long, Stapleton. 228,988.
Bierbusse, James H.: *See*—
Vizina, Clarence H., Jr., and Bierbusse. 229,126.
Biondi, Aldo L., M. A. Kaufman, W. A. Vierow, and M. Weisman, to International Playtex Corp. Hanger. 229,004, 11–6–73, Cl. D6—254.
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Horgan, William J., Jr. 229,024.
Bordenave, Franklin D. J. Dual purpose gaff and fishhook dislodger. 229,051, 11–6–73, Cl. D22—22.
Boucher, Guy, to Societe des Accumulateurs Fixes et de Traction. Flashlight. 229,089, 11–6–73, Cl. D48—24.
Boyle, Robert E. Child's riding vehicle. 229,079, 11–6–73, Cl. D34—15.
Brandow, Vivian M Combined bottle opener and can piercer. 229,021, 11–6–73, Cl. D8—18.
Brannon, Arthur J., to Kids Stuff Creations. Clothes hanger. 229,002, 11–6–73, Cl. D6—248.
Brandt, Harvey R., and N. Werner, to Gavin Electronics Division, Antennacraft Co. Television antenna. 229,071, 11–6–73, Cl. D26—14.
Brandt, Harvey B., and N. Werner, to Gavin Electronics Division, Antennacraft Co. Television antenna. 229,072, 11–6–73, Cl. D26—14.
Brickel, Robert W. Combined tray and pet food bowls or similar article. 229,073, 11–6–73, Cl. D30—16.
Cannondale Corp.: *See*—
Davis, Ronald N. 229,125.
Chrysler Corp.: *See*—
Quick, Paul F. 229,035.
Ciambra, Frank P., and H. Noriega. Finger ring. 229,087, 11–6–73, Cl. D45—10.
Clairol Inc.: *See*—
Benty, John L., Depano, and Kallman. 229,121.
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Conner, James M.: *See*—
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Cooper, F. Wayne. Utility clip. 229,033, 11–6–73, Cl. D8—259.
Coplon, Edward M., to Hodgson Houses, Inc. Modular house. 229,040, 11–6–73, Cl. D13—1.
Corini, Louis J., to Louis J. Corini. Controlled temperature chest. 229,101, 11–6–73, Cl. D67—3.
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Fischer, Richard. 228,982.
Corte, Francisco B. Writing instrument. 229,110, 11–6–73, Cl. D74—17.
Costa, Allan. Casing for a lip brush and an eyebrow brush. 229,115, 11–6–73, Cl. D86—10.
Courtney, Keaser H. Fish skinning pliers. 229,052, 11–6–73, Cl. D22—31.
Covey, Laird F., to The Stanley Works. Pruner shears. 229,020, 11–6–73, Cl. D8—5.
Crowell, Christopher S. Puppets. 229,075, 11–6–73, Cl. D34—2.
Cuprak, Thomas. Slurp-free pet dish. 229,074, 11–6–73, Cl. D30—16.
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Daktronics, Inc.: *See*—
Daktronics, Inc. 229,076.
Davidson, Jack. Boat hull. 229,106, 11–6–73, Cl. D71—1.
Davidson, Saul: *See*—
Baker, Kenneth R., Plescia, and Ferguson. 229,103.
Davis, Franklin S. Corn dish. 229,005, 11–6–73, Cl. D7—5.
Davis, Ronald N., to Cannondale Corp. Bicycle trailer. 229,125, 11–6–73, Cl. D90—3.
Deere & Co.: *See*—
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Depano, Dominic: *See*—
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Dolby, John T., and J. S. Adler, to Standard Oil Co. Tray. 229,009, 11–6–73, Cl. D7—38.
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Ekdahl, Hans I., and S. E. O. Olofsson, to Handelsbolaget Under Firma Handels-Och Konsultfirman Ekdahl & Oloffsson. Loud speaker, 229,066, 11–6–73, Cl. D26—14.
Elder Wilbert Corp.: *See*—
Andrus, Edward R., Jr., Fahnstrom, and Hansen. 229,050.
Engle, Dennis L. Stereo speaker. 229,068, 11–6–73, Cl. D26—14.
Epstein, Florence D. Hat. 228,979, 11–6–73, Cl. D2—241.
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Ferdinand, Irwin J., and I. R. Kulbersh, to The Hirsh Co. Shelf bracket. 229,032, 11–6–73, Cl. D8—242.
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Fischer, Richard, to Coronet-Werke Heinrich Schierf GmbH. Reversible double brush. 228,982, 11–6–73, Cl. D4—13.
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Foresta, Francis A., to T. A. D. Avanti, Inc. Electronic telephone answering unit. 29,067, 11–6–73, Cl. D26—14.
Fortriede, Charles J. Centerline gauge. 229,093, 11–6–73, Cl. D52—6.
Freedman, Alan L., and F. D. Allen, to Bergman Tool Mfg. Co., Inc. Combined battery cable cutting tool and wire stripper. 229,022, 11–6–73, Cl. D8—52.
Freiling, Paul E., and J. E. Smith. Instrument and accessory panel for vehicles. 229,044, 11–6–73, Cl. D14—6.
Fry, James C., to Rubbermaid Inc. Caddy for electric drill and accessories. 229,123, 11–6–73, Cl. D87—1.
Funahashi, Takaji. Packaging box. 229,037, 11–6–73, Cl. D9—223.
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Brandt, Harvey B., and Werner. 229,072.
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General Foods Corp.: *See*—
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General Mills, Inc.: *See*—
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Giordano, Dominick A., 20% interest to The Raymond Lee Organization. Combined clock face and hands. 229,084, 11–6–73, Cl. D42—1.
Grosse, Wolfgang C. F. Letter tray. 229,108, 11–6–73, Cl. D74—9.
Grotz, Edward C. Sprinkling can. 229,056, 11–6–73, Cl. D23—11.
Halberstadt, Lewis J., to Vistron Corp. Tooth stain-remover tip for toothbrushes and the like. 228,981, 11–6–73, Cl. D4—24.
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Horgan, William J., Jr., to Blumcraft of Pittsburgh. Door handle, lock housing and plate ensemble. 229,024, 11–6–73, Cl. D8—138.
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Legresley, Edsel 228,995.
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Ishii, Shogo, to Sentak Co., Ltd. Case for manicuring implements or the like. 229,116. 11–6–73, Cl. D86—10.
Iskander, Farid A., to Herman Miller, Inc. Bench. 228,986, 11–6–73, Cl. D6—58.
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Jackson, William E. Shaving equipment holder. 228,993, 11–6–73, Cl. D6—91.
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Javkin, Simon. Combined handle and mounting member. 229,026, 11–6–73, Cl. D8—154.
Joonase, Paul, to W. R. Grace & Co. Packaging tray for meat or the like. 229,036. 11–6–73. Cl. D9—219.
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Kitson, Gerald L. Poultry feeder pipe support. 229,030, 11–6–73, Cl. D8—235.
Konecky, Louis E. Housing for rake for fluffing carpets. 229,017, 11–6–73, Cl. D7—177.
Kourimsky, Friedrich J. A., to AMP Inc. Combination plug and socket polygonal connector. 229,062, 11–6–73, Cl. D26—1.
Kroger, Douglas J. Combined contact lens solution, lens and water tray case. 229,097, 11–6–73, Cl. D57—1.
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Lea, Melvin A., to General Mills, Inc. Spoon or similar article. 229,014, 11–6–73, Cl. D7—137.
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Leblanc, Paul. Septic tank. 229,053, 11–6–73, Cl. D23—2.
Lee, Herbert P., to Wilton/Lee Ltd. Decorative panel. 229,899, 11–6–73, Cl. D6—192.
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Martinelli, Arnold C. Planter or similar article. 229,081, 11–6–73, Cl. D35—3.
Martinelli, Arnold C. Planter. 229,082, 11–6–73, Cl. D34—3.
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Quenot, Michel. Combined weighing scale and fishhook remover. 229,092, 11–6–73, Cl. D52—1.
Quick, Paul F., to Chrysler Corporation. Fuel can. 229,035, 11–6–73, Cl. D9—175.
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Richardson, Glen E. Ornamental design for a boat. 229,102, 11–6–73, Cl. D71—1.
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Ruhan, Paul F. Mold for chopped meat product. 229,011, 11–6–73, Cl. D7—43.
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Shacklett, John B. Musical instrument. 229,096, 11–6–73, Cl. D56—1.
Shechtman, Barry S., and A. Spivak. Boot extractor. 229,118, 11–6–73, Cl. D86—10.
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Stanley Works, The: *See*—
Covey, Laird F. 229,020.
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Ishii, Shogo. 229,116.
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Foresta, Francis A. 229,067.
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Reinecke, Jean O. and Speak. 228,994.
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Janssens, Wilhelmus G. E. 228,983.
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Zierhut, Clarence D., and Vedder. 229,063.
Villanova, David R.: *See*—
Villanova, Kenneth F. 228,990.
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Vistron Corp.: *See*—
Halberstadt, Lewis J. 228,981.
Vizina, Clarence H., Jr., and J. H. Bierbusse, to Uniroyal, Inc. Pneumatic tire tread and buttress. 229,126, 11–6–73, Cl. D90—20.
W. R. Grace & Co.: *See*—
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Wahl, Michael, to Wahl Associates, Inc. Display hanger for shoes. 229,001, 11–6–73, Cl. D6—247.
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Werner, Nicholas: *See*—
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Brandt, Harvey R., and Werner. 229,072.
Williams, Allen R., Jr.: *See*—
Scalingi, Albert V., and Williams. 229,077.
Wilson, Michael C.: *See*—
O'Neil, Robert, and Wilson. 229,000.
Wilton/Lee Ltd.: *See*—
Lee, Herbert P. 228,999.
Winrow, Thomas, to Mohasco Industries, Inc. Lounge chair. 228,985, 11–6–73, Cl. D6—39.
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90 3,769,634
243R 3,769,635

CLASS 3
1.1 3,769,636

CLASS 4
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172.12 3,769,639
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CLASS 5
81A 3,769,642
109 3,769,641
351 3,769,643

CLASS 6
19 3,769,788

CLASS 7
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CLASS 8
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8P 3,769,646
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CLASS 10
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CLASS 12
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CLASS 13
31 3,770,870

CLASS 15
105 3,769,650
121 3,769,651
167A 3,769,652
250.34 3,769,654
250.42 3,769,653

CLASS 16
126 3,769,655

CLASS 17
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CLASS 19
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161P 3,769,659
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CLASS 21
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CLASS 23
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230R 3,770,379
3,770,381
253TP 3,770,383
253R 3,770,382
258.5 3,770,384
260 3,770,385
270 3,770,386
281 3,770,387
284 3,770,388
288F 3,770,389
300 3,770,390

CLASS 24
73HS 3,769,662
73PF 3,769,661
81AD 3,769,663
217 3,769,664
274R 3,769,665

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15R 3,769,666

CLASS 28
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64 3,769,668
72.1 3,769,669

CLASS 29
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149.5B 3,769,672
157.1R 3,769,673
157.3R 3,769,674
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177 3,769,676
182 3,770,391
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191 3,770,393
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194 3,770,395
199 3,770,396
200B 3,769,678
200P 3,769,677
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203D 3,769,681
203H 3,769,680
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267 3,769,683
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527 3,769,702
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604 3,769,699
607 3,769,700
624 3,769,701
628 3,769,703
3,769,704

CLASS 30
90.1 3,769,705
113.3 3,769,706

CLASS 32
27 3,769,707
32 3,769,708

CLASS 33
1BB 3,769,709
141G 3,769,711
164R 3,769,712
174L 3,769,713
180R 3,769,714
320 3,769,710
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21C 3,769,726
62 3,769,727
64 3,769,637
70R 3,769,728
129B 3,769,729
156 3,769,730

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89 3,769,732
3,769,733

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24 3,769,735
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42.26 3,769,738
42.35 3,769,739
44.99 3,769,740
57.5R 3,769,741
81 3,769,742

CLASS 44
75 3,770,397

CLASS 46
1C 3,769,743
33 3,769,744
135A 3,769,745
206 3,769,746

CLASS 47
31 3,769,747
38.1 3,769,748

CLASS 48
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202 3,770,398
3,770,399

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130 3,769,749
477 3,769,750

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5 3,769,752
11 3,769,753
14 3,769,754
43 3,769,756
101LG 3,769,755
102 3,769,757
163 3,769,758
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204 3,769,760
237CS 3,769,761
284 3,769,762
295 3,770,400
308 3,770,401

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69 3,769,765
73 3,769,766
145 3,769,767
154 3,769,768
212 3,769,769
404 3,769,770
634 3,769,771
646 3,769,772
656 3,769,773
698 3,769,774
731 3,769,775

CLASS 53
76 3,769,777
182 3,769,778

CLASS 55
67 3,769,776
166 3,769,779
261 3,769,781
276 3,769,780

CLASS 56
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63 3,769,783
295 3,769,784

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58.89 3,769,785
105 3,769,786
144 3,769,787

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39.08 3,769,790
39.16R 3,769,793
39.28R 3,769,791
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108 3,769,796
226R 3,769,797
279 3,769,798
303 3,769,799
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594 3,769,794

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85 3,769,804

CLASS 62
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55.5 3,769,806
63 3,769,807
115 3,769,808
137 3,769,809
183 3,769,810
224 3,769,811
352 3,769,812

CLASS 64
2R 3,769,813

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23 3,770,405
43 3,770,403
51 3,770,406
59 3,770,404
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225 3,770,409

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76R 3,769,814
85A 3,769,815
193 3,769,816

CLASS 68
5D 3,769,817
18F 3,769,818
213 3,769,819

CLASS 69
46 3,769,820

CLASS 70
33 3,769,821
107 3,769,822

CLASS 71
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24 3,770,411
98 3,770,412
116 3,770,413

CLASS 72
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41 3,769,824
76 3,769,825
191 3,769,826
302 3,769,836
450 3,769,828

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15.6 3,769,830
23 3,769,837
32 3,769,831
41 3,769,832
147 3,769,833
149 3,769,834
170A 3,769,838
202 3,769,835
339A 3,769,839
382 3,769,840
398R 3,769,827
425.4P 3,769,841
425.6 3,769,842
432R 3,769,843
517R 3,769,844

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118 3,769,847
217B 3,769,848
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752E 3,769,858

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25 3,770,416
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68R 3,770,420
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91 3,770,421
103 3,770,422
108 3,770,423
128A 3,770,425
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171 3,770,427

CLASS 81
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52.5 3,769,860
53.2 3,769,861
90D 3,769,862
177A 3,769,863

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79 3,769,864
278 3,769,865
302 3,769,866
338 3,769,867
348 3,769,868

CLASS 84
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291 3,769,871
470 3,769,872

CLASS 86
1R 3,769,873
20C 3,769,874

CLASS 89
1B 3,769,875
1.8 3,769,876

CLASS 90
6 3,769,877
20 3,769,878

CLASS 91
171 3,769,881

CLASS 92
84 3,769,879
169 3,769,880
172 3,769,882

CLASS 93
1C 3,769,883
29D 3,770,431

CLASS 95
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3,769,885
10CE 3,769,888
10C 3,769,886
10T 3,769,887
18P 3,769,889
3,769,890
31AC 3,769,891
42 3,769,892
53EB 3,769,893
85 3,769,894
3,769,895
89A 3,769,896
94R 3,769,897

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1.5 3,770,428
29R 3,770,432
36 3,770,433
36.1 3,770,434
45 3,770,435
56.5 3,770,436
60R 3,770,437
67 3,770,438
76C 3,770,441
77 3,770,439
82 3,770,442
86P 3,770,443
99 3,770,444
100 3,770,445
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124 3,770,449
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139 3,770,440

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CLASS 99
324 3,769,899
348 3,769,900
444 3,769,901
472 3,769,902
589 3,769,903

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158C 3,769,904
289 3,769,905

CLASS 101
91 3,769,906
93C 3,769,907
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148 3,769,909
177 3,769,910

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7.4 3,769,911
93 3,769,912

CLASS 104
88 3,769,913
148LM 3,769,914
172BT 3,769,915
173R 3,769,916

CLASS 105
248 3,769,918
369B 3,769,917

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56 3,770,466
58 3,770,467
110 3,770,468
120 3,770,469
193J 3,770,470
197C 3,770,471
213 3,770,472
220 3,770,473
288Q 3,770,474
306 3,770,475
309 3,770,476

CLASS 108
83 3,769,919
133 3,769,920

CLASS 110
8R 3,769,921
28J 3,769,922
184 3,769,923

CLASS 112
121.29 3,769,924
256 3,769,925

CLASS 114
.5R 3,769,926
66.5P 3,769,927
221R 3,769,928

CLASS 115
1R 3,769,929
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CLASS 116
28R 3,769,931
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124.2A 3,769,933

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3.4 3,770,478
3,770,479
4 3,770,480
10 3,770,481
17 3,770,482
33 3,770,483
37LE 3,770,484
3,770,485
38 3,770,486
46CA 3,770,487
47R 3,770,488
76T 3,770,489
93.31 3,770,490
3,770,491
107.2 3,770,492
132CF 3,770,493
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138.8D 3,770,495
212 3,770,496
3,770,497
219 3,770,498
221 3,770,499
237 3,770,500

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CLASS 119
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52B 3,769,937
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126 3,769,940

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406R 3,769,941
479S 3,769,942
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8.47 3,769,946
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41.31 3,769,948
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99 3,769,949
103C 3,769,951
136 3,769,952
195R 3,769,953
198E 3,769,954

CLASS 124

16 3,769,955
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CLASS 126

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20 3,769,958
91 3,769,959

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2R 3,769,963
2T 3,769,961
2.05F 3,769,966
2.05P 3,769,974
2.05R 3,769,965
2.08 3,769,967
17 3,769,968
68 3,769,969
77 3,769,970
132D 3,769,971
142.5 3,769,972
145.8 3,769,973
205G 3,769,964
214.4 3,769,975
229 3,769,976
3,769,977
287 3,769,978
290R 3,769,979
304 3,769,980
349B 3,769,981
350 3,769,982
351 3,769,983
404 3,769,984
419P 3,769,986
419R 3,769,985
484 3,769,987

CLASS 130

30H 3,769,988

CLASS 131

21D 3,769,989
81 3,769,990

CLASS 132

84R 3,769,991

CLASS 134

19 3,770,501
144 3,769,992
167R 3,769,993

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6LF 3,770,503
10 3,770,504
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86A 3,770,508
120FC 3,770,509
134R 3,770,510
135S 3,770,511

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312 3,770,002
315 3,770,004
340 3,770,005
499 3,770,006
501 3,770,007
516.25 3,770,008
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587 3,770,011
596.16 3,770,012
606 3,770,013
614.2 3,770,014
624.11 3,770,015
625.17 3,770,017
625.22 3,770,016
625.42 3,770,018
627.5 3,770,019
802 3,770,020
819 3,770,021
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CLASS 138

108 3,770,022
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CLASS 139

188 3,770,024

CLASS 140

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CLASS 141

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34 3,770,027
59 3,770,028
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CLASS 144

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136R 3,770,031
288A 3,770,032

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61C 3,770,033

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CLASS 149

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22 3,770,526
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CLASS 150

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CLASS 151

41.7 3,770,036
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CLASS 152

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330 3,770,040
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3 3,770,529
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63 3,770,535
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157 3,770,540
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314 3,770,547
353 3,770,548
474 3,770,549
498 3,770,550
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583 3,770,553

CLASS 160

16 3,770,043

CLASS 161

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39 3,770,556
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65 3,770,558
89 3,770,559
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144 3,770,561
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162 3,770,563
183 3,770,564
184 3,770,565
189 3,770,566
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217 3,770,572
227 3,770,573

CLASS 162

31 3,770,574
100 3,770,575
158 3,770,576
159 3,770,577
206 3,770,578
264 3,770,579
341 3,770,580
348 3,770,581

CLASS 164

35 3,770,044
118 3,770,045
283 3,770,046
338 3,770,047

CLASS 165

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41 3,770,049
97 3,770,050
105 3,770,051

CLASS 166

.5 3,770,052
3,770,053
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244C 3,770,055
273 3,770,056
306 3,770,057
310 3,770,058

CLASS 169

1A 3,770,059
2R 3,770,061
24 3,770,060
3,770,062
39 3,770,063

CLASS 171

58 3,770,064

CLASS 172

4.5 3,770,065
194 3,770,066

CLASS 174

11R 3,770,871
53 3,770,872
58 3,770,873
68.5 3,770,874
88B 3,770,875
88R 3,770,876
143 3,770,877
153R 3,770,878

CLASS 175

95 3,770,067

CLASS 176

76 3,770,583
78 3,770,582

CLASS 177

1 3,770,069
134 3,770,068

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5.4ST 3,770,881
5.4P 3,770,883
5.4R 3,770,884
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6.5 3,770,887
6.6B 3,770,888
6.7R 3,770,886
7.6 3,770,890
7.9 3,770,889

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7MM 3,770,893
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15BF 3,770,894
15BS 3,770,897
18AB 3,770,898
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18F 3,770,896
84VF 3,770,900
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3,770,907
100.2MD 3,770,903
100.2ZA 3,770,902
3,770,904
100.2C 3,770,906
100.2Z 3,770,908
100.3B 3,770,909
3,770,910
100.4ST 3,770,901
107S 3,770,911
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13 3,770,070
15 3,770,071
24.09 3,770,072
65F 3,770,074
65R 3,770,073
66F 3,770,075
66R 3,770,076
71 3,770,077
111 3,770,078
127 3,770,079

CLASS 181

.5H 3,770,080
36B 3,770,081

CLASS 188

71.9 3,770,082
79.5GC 3,770,083
265 3,770,084

CLASS 191

12.2A 3,770,914

CLASS 192

13R 3,770,085
16 3,770,086
18B 3,770,087
70.27 3,770,088

CLASS 194

1B 3,770,090
1N 3,770,089

CLASS 195

2 3,770,584
29 3,770,585
51E 3,770,586
63 3,770,587
3,770,588
66R 3,770,589
80 3,770,590
139 3,770,591

CLASS 197

1R 3,770,091
3,770,092
1.5 3,770,093
18 3,770,094
3,770,095

CLASS 198

21 3,770,096
25 3,770,098
36 3,770,099
38 3,770,100
115 3,770,101
127R 3,770,102
127 3,770,103
131 3,770,104
138 3,770,105
154 3,770,106
157 3,770,107
208 3,770,108
213 3,770,109
220BA 3,770,097
220DA 3,770,110

CLASS 200

6A 3,770,915
44 3,770,916
50AA 3,770,917
61.08 3,770,918
61.58B 3,770,919
67A 3,770,920
68 3,770,921
146R 3,770,922
153LB 3,770,924
153J 3,770,923
166SD 3,770,926
168C 3,770,925

CLASS 202

236 3,770,592

CLASS 204

1T 3,770,593
15 3,770,594
29 3,770,595
43G 3,770,596
52R 3,770,597
3,770,598
55R 3,770,599
58 3,770,600
159.15 3,770,602
180R 3,770,603
181 3,770,601
3,770,604
188 3,770,605
192 3,770,606
195M 3,770,608
3,770,609
195P 3,770,607
217 3,770,610
256 3,770,611
261 3,770,612
290R 3,770,613

CLASS 206

.82 3,770,121
5A 3,770,113
8 3,770,114
45.14 3,770,116
45.32 3,770,115
46FC 3,770,117
47R 3,770,118
63.2R 3,770,119
79 3,770,120
84 3,770,122

CLASS 208

62 3,770,614
120 3,770,615
138 3,770,616
216 3,770,617
3,770,618
255 3,770,619
297 3,770,620
310 3,770,621
340 3,770,622

CLASS 209

15 3,770,184
73 3,770,111
75 3,770,112
107 3,770,123
139A 3,770,124
252 3,770,125

CLASS 210

2 3,770,623
8 3,770,624
36 3,770,625
40 3,770,626
3,770,627
3,770,628
42 3,770,629
50 3,770,630
53 3,770,631
81 3,770,126
136 3,770,127
169 3,770,128
232 3,770,129
305 3,770,130
519 3,770,131
525 3,770,132

CLASS 211

19 3,770,133
57 3,770,134
148 3,770,135

CLASS 212

10 3,770,136
12 3,770,137
55 3,770,138

CLASS 213

57 3,770,139

CLASS 214

1BB 3,770,140
1Q 3,770,141
6DK 3,770,144
6DS 3,770,143
6H 3,770,142
14 3,770,145
16.1BB 3,770,146
16.4A 3,770,147
17R 3,770,148
86A 3,770,149
89 3,770,150
152 3,770,151
374 3,770,152

CLASS 215

9 3,770,153
11B 3,770,154
37R 3,770,155
41 3,770,156

CLASS 217

44 3,770,157

CLASS 219

8.5 3,770,927
10.49 3,770,928
10.55 3,770,929
3,770,930
10.57 3,770,931
74 3,770,932
107 3,770,933
121EB 3,770,934
121LA 3,770,936
121P 3,770,935
241 3,770,937
374 3,770,938
532 3,770,939

CLASS 220

9LG 3,770,158
22.5 3,770,159
36 3,770,160
42C 3,770,161

CLASS 221

13 3,770,162
114 3,770,163
211 3,770,164

CLASS 222

136 3,770,165
145 3,770,166
153 3,770,167
182 3,770,168
309 3,770,169
402.11 3,770,170

CLASS 223

95 3,770,171

CLASS 225

2 3,770,172
3,770,173

CLASS 226

107 3,770,174
110 3,770,175
176 3,770,176
194 3,770,177
198 3,770,178

CLASS 227

48 3,770,180
146 3,770,182

CLASS 228

53 3,770,183

CLASS 229

17G 3,770,185
23R 3,770,186
39R 3,770,187
53 3,770,188
3,770,189

CLASS 233

15 3,770,190
23A 3,770,191

CLASS 235

61.11E 3,770,940
3,770,942
3,770,944
61.12R 3,770,943
61.7R 3,770,941
88 3,770,192
92EA 3,770,945
117R 3,770,193
150.1 3,770,946
151.11 3,770,947
153AE 3,770,948
181 3,770,949

CLASS 236

13 3,770,195
15B 3,770,194

CLASS 237

8C 3,770,197
9R 3,770,196

CLASS 239

10 3,770,198
54 3,770,199
102 3,770,200
135 3,770,201
184 3,770,202
205 3,770,203
288.5 3,770,204
317 3,770,205
349 3,770,206
397.5 3,770,207
417.3 3,770,208
434 3,770,209
532 3,770,210
567 3,770,211

CLASS 240

2BB 3,770,950
10T 3,770,951
51.11R 3,770,952
73BJ 3,770,953

CLASS 241

1 3,770,212
24 3,770,213
42 3,770,214
77 3,770,215
82.1 3,770,216
135 3,770,217
301 3,770,218

CLASS 242

7.22 3,770,219
35.6E 3,770,220
55.19A 3,770,223
55.2 3,770,221
55.3 3,770,222
107.4 3,770,224
3,770,225

CLASS 244

3.21 3,770,226
42CC 3,770,227
53B 3,770,228
154 3,770,229
155A 3,770,230

CLASS 248

9 3,770,231
21 3,770,232
55 3,770,233
117.7 3,770,234
399 3,770,235
408 3,770,236

CLASS 249

3 3,770,237

CLASS 250

41.9SE 3,770,954
52 3,770,955
59 3,770,956
71T 3,770,957
201 3,770,965
205 3,770,966
214R 3,770,967
3,770,968
223B 3,770,969
231SE 3,770,970
3,770,971
282 3,770,337
324 3,770,972
331 3,770,961
339 3,770,958
340 3,770,973

344 3,770,974
375 3,770,959
409 3,770,963
460 3,770,960
473 3,770,962
491 3,770,975
506 3,770,964

CLASS 251

3 3,770,238
9 3,770,239
15 3,770,240
76 3,770,241
282 3,770,247
305 3,770,242
366 3,770,243

CLASS 252

8.55D 3,770,632
28 3,770,633
29 3,770,634
48.6 3,770,635
49.5 3,770,636
62.1 3,770,637
3,770,638
62.57 3,770,639
68 3,770,640
90 3,770,641
107 3,770,642
117 3,770,643
135 3,770,644
182 3,770,645
187 3,770,646
190 3,770,647
305 3,770,648
312 3,770,649
313S 3,770,650
378R 3,770,651
387 3,770,652
408 3,770,653
3,770,654
431N 3,770,655
442 3,770,656
3,770,657
443 3,770,658
465 3,770,659
467 3,770,660

CLASS 254

164 3,770,244

CLASS 256

24 3,770,245
25 3,770,246

CLASS 259

1 3,770,248
4 3,770,249
6 3,770,250
103 3,770,251
107 3,770,252
172 3,770,253

CLASS 260

2A 3,770,664
2R 3,770,661
2.1E 3,770,666
2.5AP 3,770,671
2.5B 3,770,663
2.5D 3,770,669
2.5E 3,770,668
2.5P 3,770,665
3,770,670
2.5S 3,770,662
17.4BB 3,770,674
17.4GC 3,770,673
17.4ST 3,770,672
22CB 3,770,667
22EP 3,770,675
23XA 3,770,676
28 3,770,678
28.5R 3,770,677
29.2TN 3,770,681
29.4UA 3,770,685
29.6RW 3,770,683
29.6TA 3,770,679
3,770,680
29.7NR 3,770,684
29.7B 3,770,682
30.2 3,770,686
30.4SB 3,770,687
32.8A 3,770,688
37EP 3,770,690
37N 3,770,691
41C 3,770,692
45.8NZ 3,770,693
45.9R 3,770,694
47UP 3,770,698
47XA 3,770,696
3,770,697
49 3,770,699
64 3,770,700
73R 3,770,702
77.5TB 3,770,703
78UA 3,770,705
78R 3,770,704
79.3R 3,770,706
79.5B 3,770,707
80.73 3,770,708
80.78 3,770,709
83.7 3,770,710
87.5A 3,770,711
93.5S 3,770,712
93.7 3,770,713
3,770,714
112.5 3,770,715
121 3,770,853
146R 3,770,716
153 3,770,717
158 3,770,719
175 3,770,718
211.5R 3,770,720
239HM 3,770,721
239D 3,770,723
239.1 3,770,722
239.3P 3,770,724
239.5 3,770,725
239.55D 3,770,726
240TC 3,770,728
3,770,729
240F 3,770,730
240.8 3,770,727
243R 3,770,732
3,770,733
244R 3,770,734
248AS 3,770,735
248NS 3,770,731
249.8 3,770,736
250A 3,770,738
250 3,770,739
256 3,770,741
256.4F 3,770,740
3,770,742
268PH 3,770,743
283S 3,770,744
3,770,745
289QP 3,770,746
293.73 3,770,747
293.81 3,770,748
294.8D 3,770,749
294.8R 3,770,750
294.9 3,770,751
295.5A 3,770,753
295.5H 3,770,752
302SD 3,770,754
302E 3,770,756
302R 3,770,755
304 3,770,757
305 3,770,758
306 3,770,759
306.8D 3,770,760
307C 3,770,761
308R 3,770,762
309 3,770,763
3,770,764
314.5 3,770,765
325 3,770,766
326E 3,770,768
326.14R 3,770,771
326.15 3,770,767
327H 3,770,770
327M 3,770,769
332R 3,770,689
332.1 3,770,772
338 3,770,773
340.5 3,770,774
343.2R 3,770,775
345.7 3,770,776
345.8 3,770,777
349 3,770,778
3,770,779
397.3 3,770,780
404 3,770,781
3,770,783
408 3,770,784
413 3,770,782
429J 3,770,785
439CY 3,770,786
3,770,787
448A 3,770,789
448R 3,770,788
448.2B 3,770,790
448.2E 3,770,791
463 3,770,792
3,770,793
464 3,770,794
465C 3,770,800
465.4 3,770,795
3,770,796
465.5R 3,770,798
3,770,799
465.9 3,770,797
470 3,770,801
471C 3,770,695
473S 3,770,802
475FR 3,770,803
475R 3,770,804
482P 3,770,807
482R 3,770,805
3,770,806
484R 3,770,808
485G 3,770,809
486D 3,770,812
486R 3,770,810
3,770,811
497R 3,770,813
501.12 3,770,815
501.18 3,770,814
502R 3,770,816
513.7 3,770,817
515P 3,770,818
3,770,819
516 3,770,820
518R 3,770,821
523R 3,770,835
534S 3,770,822
535H 3,770,823
543H 3,770,824
557B 3,770,825
558S 3,770,826
563R 3,770,827
566A 3,770,828
586R 3,770,829
606 3,770,830
606.5F 3,770,831
607A 3,770,832
613D 3,770,833
615B 3,770,701
621N 3,770,834
631R 3,770,836
635D 3,770,837
653 3,770,838
666B 3,770,839
666P 3,770,840
668A 3,770,841
677A 3,770,842
677R 3,770,843
683.65 3,770,845
683.9 3,770,844
823 3,770,846
827 3,770,847
836 3,770,848
857G 3,770,849
858 3,770,850
884 3,770,851
897B 3,770,852
985 3,770,854
987 3,770,855

CLASS 261

105 3,770,254
114VT 3,770,255

CLASS 264

13 3,770,856
33 3,770,857
36 3,770,858
71 3,770,859
89 3,770,860
130 3,770,861
148 3,770,862
261 3,770,863
268 3,770,864
279 3,770,865
290T 3,770,866
294 3,770,458
3,770,867

CLASS 266

4F 3,770,256
18 3,770,257

CLASS 267

35 3,770,258

CLASS 268

250R 3,770,737

CLASS 269

21 3,770,259
23 3,770,260
47 3,770,261
289 3,770,262

CLASS 270

58 3,770,263
79 3,770,264

CLASS 271

10 3,770,265
97 3,770,266

CLASS 272

58 3,770,267
74 3,770,268

CLASS 273

1E 3,770,269
54B 3,770,270
86R 3,770,271
97R 3,770,272
101 3,770,273
105.2 3,770,274
106R 3,770,275
119R 3,770,276
135C 3,770,277
153R 3,770,278
167G 3,770,279
183B 3,770,280

CLASS 274

4D 3,770,281
4E 3,770,283
4F 3,770,282

CLASS 277

2 3,770,179
92 3,770,284
96 3,770,181
165 3,770,285
235A 3,770,286

CLASS 279

2 3,770,287

CLASS 280

11.35N 3,770,288
36R 3,770,289
106.5R 3,770,290
124B 3,770,291
124F 3,770,292
150SB 3,770,294
150R 3,770,293
229 3,770,295
407 3,770,296
423R 3,770,297
457 3,770,298
507 3,770,299
511 3,770,300

CLASS 285

15 3,770,301
22 3,770,302
45 3,770,303
3,770,304
110 3,770,305

CLASS 292

169 3,770,306
307R 3,770,307

CLASS 294

19A 3,770,308
64R 3,770,310
81SF 3,770,309

CLASS 296

1R 3,770,311
28C 3,770,312
95C 3,770,313
137B 3,770,314

CLASS 297

284 3,770,315
438 3,770,316
445 3,770,317
453 3,770,318
461 3,770,319

CLASS 298

17S 3,770,320

CLASS 299

34 3,770,321
37 3,770,322

CLASS 301

38R 3,770,323

CLASS 303

6C 3,770,326
9 3,770,324
10 3,770,325
21F 3,770,328
21R 3,770,327
22R 3,770,329

CLASS 305

24 3,770,330
187.2 3,770,992

CLASS 307

10R 3,770,976
41 3,770,977
88LC 3,770,978
141 3,770,979
3,770,980
154 3,770,981
215 3,770,982
235R 3,770,983
3,770,985
237 3,770,984
270 3,770,986
293 3,770,987
304 3,770,988
305 3,770,989

CLASS 308

72 3,770,331
3,770,990
187.1 3,770,991
187.2 3,770,993
207 3,770,994
237R 3,770,332

CLASS 310

13 3,770,995
68D 3,770,996
82 3,770,997
156 3,770,998
165 3,770,999

CLASS 312

183 3,770,333
223 3,770,334

CLASS 313

63 3,771,000
68R 3,771,001
69C 3,771,002
70C 3,771,003
95 3,771,004
101 3,771,005
118 3,771,006
183 3,771,007
218 3,771,008
228 3,771,009

CLASS 315

3.5 3,771,010
26 3,771,011
86 3,771,012
101 3,771,013
136 3,771,014
169TV 3,771,016
169R 3,771,015
200A 3,771,019
200R 3,771,017
3,771,018

CLASS 317

18C 3,771,020
33VR 3,771,021
52 3,771,022
100 3,771,023
3,771,024
234R 3,771,025
3,771,026
235R 3,771,027
3,771,028
3,771,029
3,771,030
3,771,031

CLASS 318

8 3,771,032
13S 3,771,034
135 3,771,033
3,771,035
139 3,771,036
580 3,771,037
636 3,771,038

CLASS 320

2 3,771,039
39 3,771,043

CLASS 321

2 3,771,040
5 3,771,041
11 3,771,042
69NL 3,771,044

CLASS 322

28 3,771,045
63 3,771,046

CLASS 324

.5R 3,771,054
3,771,055
16R 3,771,047
28RS 3,771,048
51 3,771,049
57R 3,771,050
3,771,056
3,771,057
61R 3,771,051
71CP 3,771,058
119 3,771,052
140R 3,771,053

CLASS 325

31 3,771,059
50 3,771,060
67 3,771,061

CLASS 328

55 3,771,062
134 3,771,063

CLASS 331

94.5D 3,771,066
3,771,067
94.5L 3,771,065

CLASS 333

1 3,771,064
20 3,771,068
24C 3,771,069
26 3,771,070
28R 3,771,071
30R 3,771,072
3,771,073
83R 3,771,074
84M 3,771,075
95R 3,771,076
3,771,078
95S 3,771,077

CLASS 334

70 3,771,079

CLASS 335

9 3,771,081
51 3,771,080
153 3,771,083
285 3,771,084

CLASS 336

182 3,771,085
192 3,771,086

CLASS 337

112 3,771,087
123 3,771,088
277 3,771,089
318 3,771,090

CLASS 338

20 3,771,091
32R 3,771,092
132 3,771,093
143 3,771,094
320 3,771,095

CLASS 339

3 3,771,096
14P 3,771,097
14R 3,771,098
16R 3,771,099
17LM 3,771,100
17C 3,771,101
19 3,771,102
21R 3,771,103
31R 3,771,104
36 3,771,105
52 3,771,106
96 3,771,107
113R 3,771,108
174 3,771,109
214S 3,771,110
223R 3,771,111
244B 3,771,112
256C 3,771,113

CLASS 340

1R 3,771,114
5D 3,771,115
5H 3,771,116
8R 3,771,117
18R 3,771,118
23 3,771,119
25 3,771,120
52R 3,771,121
62 3,771,122
104 3,771,123
146.1AL 3,771,126
146.1F 3,771,125
146.2 3,771,128
146.3E 3,771,124
3,771,129
146.3J 3,771,127
147LP 3,771,130
172.5 3,771,131
3,771,132
3,771,133
3,771,134
3,771,135
3,771,136
3,771,137
3,771,138
3,771,139
3,771,140
3,771,141
3,771,142
3,771,143
3,771,144
3,771,146
173CC 3,771,150
173LT 3,771,149
173R 3,771,145
3,771,147
3,771,148
244C 3,771,151
258C 3,771,152
274 3,771,153
275 3,771,154
324AD 3,771,155
325 3,771,156

CLASS 343

708 3,771,157
728 3,771,158
729 3,771,159
756 3,771,160
770 3,771,161
806 3,771,162
854 3,771,163

CLASS 346

134 3,771,164
140 3,771,165
3,771,166

CLASS 350

1 3,770,335
3.5 3,770,336
96R 3,770,338
160R 3,770,339
162SF 3,770,340
220 3,770,341

CLASS 351

7 3,770,342
55 3,770,343

CLASS 353

38 3,770,344

CLASS 355

3R 3,770,345
3 3,770,346
43 3,770,347
67 3,771,082
102 3,770,348

CLASS 356

73 3,770,349
75 3,770,350
102 3,770,351
133 3,770,352
152 3,770,353
178 3,770,354
189 3,770,355
207 3,770,356

CLASS 423		291	3,770,358	12	3,770,454	354	3,770,456	47	3,770,363	**CLASS 432**	
50	3,770,868	305	3,770,359	186	3,770,462	380	3,770,461	78	3,770,364	15	3,770,369
54	3,770,869	440	3,770,360	190	3,770,452	394	3,770,457	79	3,770,365		
CLASS 425		445	3,770,361	212	3,770,463	477	3,770,455	94	3,770,366	**CLASS 444**	
131	3,770,357	**CLASS 426**		227	3,770,453	**CLASS 431**		277	3,770,367	1	3,771,167
		8	3,770,459	279	3,770,460	13	3,770,362	354	3,770,368		3,771,168

CLASSIFICATION OF DESIGNS

D02—	29	228,980		248	229,002		154	229,026		31	229,052		K	229,077	D71—	1BB	229,105
	231	228,978		252	229,003		166	229,027	D23—	2	229,053		15AJ	229,079		Q	229,102
	241	228,979		254	229,004		203	229,028		3	229,054		K	229,078			229,106
	361	228,977	D07—	5	229,005		226	229,029		4	229,025	D35—	1	229,080		S	229,103
D04—	13	228,982		6	229,006		235	229,030		11	229,056		3A	229,081			229,104
	15	228,983		14	229,007		242	229,031		36	229,057			229,082	D74—	9A	229,108
	24	228,981			229,008			229,032		91	229,058	D40—	1	229,083		17B	229,107
D06—	8	229,047		38	229,009		259	229,033		165	229,059	D42—	B	229,084			229,109
	28	228,984		43	229,010	D09—	2	229,034	D24—	1B	229,060		8R	229,085			229,110
	39	228,985			229,011		175	229,035	D25—	R	229,061	D45—	10A	229,086	D83—	1A	229,112
	58	228,986		65	229,012		219	229,036	D26—	A	229,062		C	229,087		F	229,111
	71	228,987		107	229,013		223	229,037		5B	229,064		15	229,088		V	229,113
		228,988			229,013		257	229,038		C	229,063	D48—	23R	229,090	D85—	2B	229,114
	78	228,989		137	229,014	D13—	1A	229,040			229,065		24A	229,089	D86—	10C	229,116
	80	228,990		155	229,015		E	229,039		14A	229,067		27R	229,091			229,117
	83	228,991		161	229,016	D14—	3	229,041		B	229,070	D52—	1	229,092		D	229,118
	85	228,992					N	229,042		F	229,066		6B	229,093		G	229,115
	91	228,993		177	229,017												
	95	228,994		193	229,018		6P	229,043			229,071	D54—	2	229,094			229,119
	127	228,995		196	229,019		13	229,044			229,072	D56—	1A	229,095			229,120
	159	228,996	D08—	5	229,020		27B	229,045		G	229,068			229,096		H	229,121
	181	228,997		18	229,021	D16—	2C	229,046		L	229,069	D57—	B	229,097	D87—	1D	229,122
	184	228,998		52	229,022		3	229,048	D30—	16	229,073		C	229,098		R	229,123
	192	228,999		61	229,023	D19—	1	229,049			229,074	D61—	F	229,099	D88—	3	229,124
	209	229,000		138	229,024	D22—	22	229,050	D34—	2R	229,075	D66—	3	229,100	D90—		229,125
	247	229,001		145	229,025			229,051		5MM	229,076	D67—	R	229,101		20R	229,126

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